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State of Connecticut
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State Geological and Natural History Survey

VOLUME V
BULLETIN 22

GUIDE
TO THE
INSECTS OF CONNECTICUT

PART III
The Hymenoptera, or Wasp-like Insects of Connecticut

HARTFORD
Printed for the State Geological and Natural
History Survey
1916

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OF THE

State Geological and Natural History Survey of Connecticut.

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GUIDE
TO THE
INSECTS OF CONNECTICUT

PREPARED UNDER THE DIRECTION OF
WILTON EVERETT BRITTON, PH. D.,
State Entomologist, and Entomologist of the Connecticut Agricultural Experiment Station

PART III

The Hymenoptera, or Wasp-like Insects, of Connecticut

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The Hymenoptera, or Wasp-like Insects of Connecticut.

INTRODUCTION.

> To ask or search I blame thee not; for Nature
> Is as the book of God before thee set,
> Wherein to read his wondrous works:
> But what created mind can comprehend
> Their number, or the wisdom infinite
> That brought them forth, but hid their causes deep?
>
> Milton.

The order Hymenoptera includes all of those insects which, with few exceptions, have four membranous wings that are few-celled, without scales, and usually transparent or translucent.

The name of this order comes from the Greek *hymen,* a membrane, and *pteron,* a wing.

As is well known, insects outnumber all other creatures, and most authorities on this subject claim that the Hymenoptera form the largest and most specialized order. One need only call to mind the complex habits of the ants, wasps, and bees to realize that the psychological development is of a higher order in these insects than in any others.

The greatest diversity in form and habit exists, so that no one species is sufficient to illustrate the entire order, which is best illustrated by the use of types of the different major subdivisions, such as sawflies, horntails, four-winged parasitic or Ichneumon flies, four-winged gall-flies, Chalcis flies, Serphus or Proctotrypoid flies, ants, wasps, and bees.

The life cycle consists of egg, larva, pupa, and adult. The eggs are easily recognized as such; the larva is usually maggot-like, without legs, and is dependent upon the parent for food. In the more primitive Hymenoptera, the sawflies and horntails, the larva has legs, and resembles a caterpillar even to the habit of providing food for itself. The pupa is comparable with the chrysalis stage in butterflies. The stages in the life of the imported Currant Worm (*Pteronidea ribesi*) are shown in Figs. 3-7.

Two of the most striking peculiarities of the Hymenoptera are that the front wings are held to the hind wings by a series of hooks on the front edge of the hind wings that fit into a fold on the hind margin of the front wings; and that as a rule the seeming hind segment of the thorax, erroneously called the metathorax, is in reality the first segment of the abdomen transferred to and fused with the real hind segment of the thorax so as to appear as part of the thorax.

Other peculiarities are the inconstant number of joints in the feelers or antennæ in the sawflies, horntails, Ichneumon flies, four-winged gall-flies, Chalcis flies, Serphus flies, and ants, as compared with the wasps and bees, in which the male and female, almost without exception, have thirteen and twelve joints respectively. Moreover, in the wasps and bees there are usually six abdominal segments in the female and seven in the male, which is not the rule in all the other groups. In the sawflies the female is provided with two saw-like appendages at the tip of the abdomen. These are used in making slits into the plant preparatory to laying eggs. The female horntail has the tip of the abdomen developed into a boring apparatus used in laying its eggs. The female of the Ichneumon flies has an egg-laying tube supported on each side by an appendage, usually of the same length as the tube. This arrangement enables the insect to pierce substances and deposit its eggs to a depth that is in some species greater than the length of the abdomen. The female of the four-winged gall-fly, Chalcis fly, and Serphus fly, is equipped in much the same way as the preceding except that the ovipositor is more commonly shorter or entirely hidden. In the ants a sting begins to show in the females and workers, while in the wasps and bees both female and worker are supplied with a sting at the tip of the abdomen. This sting is connected with a poison gland, and, when exercised by a species 10 mm. or more in length, is capable of inflicting a painful and sometimes severe wound. The poison, however, can be counteracted by the prompt administration of the chemical antidote, ammonia water.

Still other peculiarities will be noted under the different headings to follow.

The purpose of this treatise is primarily to present a ready means for determining insects belonging to the Hymenoptera, along with such cardinal facts as will leave no doubt as to the desirability of becoming familiar with the order as a whole, and more especially with those forms that are beneficial to us and the few kinds that we call injurious.

From the earliest times bees and wasps have aroused the curiosity and interest of their observers, and even Virgil showed in verse what he thought were the steps of development from putrid bullocks to bees. Since those times increasing attention has been given to these marvels of nature; and, though they are not yet receiving the investigation due them on account of their relation to our welfare, and vast stores of economic knowledge remain to be gathered by the scientist, enough has been learned to convince any one of the utility of advancing our knowledge in these paths of research.

Ichneumon flies, Chalcis flies, and Serphus flies are of great importance, because they are parasitic upon other insects, few species being known to be exempt from their attack. Eggs of dragon-flies, mantids, and many other insects are attacked, and caterpillars, from the smallest to the largest and most formidable-looking, as well as pupæ. The tussock moth that devastates our shade trees has at least seventeen kinds of these parasitic four-winged flies attacking it and checking its ravages. Some idea of the immense value of these natural checks can be gleaned from contemplating the mathematically precise calculation made by Professor Huxley on the prolific aphids or plant-lice which, if it were not for the hymenopterous parasites and other agencies, might destroy every green thing that grows. Professor Huxley has shown that the tenth generation of the progeny of a single aphis alone, exclusive of the preceding generations, would make more substance than is contained in 500,000,000 stout men, each man weighing about 280 pounds or 130 kilograms, or perhaps more than is contained in the total population of China.

The percentage of the individuals of the host affected by a given parasite varies considerably, ranging from only a few per cent. to as high as 97½ per cent., as shown by United States

Entomologist Dr. L. O. Howard in a paper on "A Case of Excessive Parasitism." The parasite in this case attacked an injurious scale insect (*Lecanium fletcheri*), and in practically one week this large percentage of offspring issued, probably from a single mother. From this brief survey of the interesting phases of insect parasites, the possibilities of breeding them on a large scale and liberating them to attack our insect foes must be apparent. It is highly probable that man can successfully employ these minute friends, whose whole ambition in life is to parasitize and thus destroy their hosts. Let us hope that the day is not far distant when the insectaries for the breeding of our insect friends will vie with the sericulture and apiculture insectaries, and be entitled to the respect now enjoyed by the vaccine, antitoxin, and other serum laboratories throughout our country.

The work of many bees is also of immense economic importance, in that they pollinate flowers, and thus cause the setting of fruit which could in no other way be effected, for certain plants are entirely dependent for fertilization upon certain bee visitors, which alone carry the pollen or fertilizing agent from the male to the female portion of the plant as they go from flower to flower in search of nectar and pollen for their own ends.

Then, too, there is the profitable industry of apiculture built upon the fact that the honey-bee (*Apis mellifera*), introduced from Europe, stores up a much greater quantity of honey than is used by the colony in the hive. Through the successful manipulation of these honey-bees alone, substances of economic importance are being put on the market. Information about the honey-bees can be found in every library, and interesting books on this species alone can be had almost anywhere.

Aside from the field of economic science that these insects offer, there is another broad field of observation that has proven of interest to people in all walks of life. This is the study of the habits of ants, wasps, and bees, both as to the homes they make and as to their relations to plants.

Temperature, moisture, and soil are the more important factors that govern the distribution of plants; hence the same phenomena directly and indirectly influence the distribution of insects, and furnish a basis for the study of the geographical distribution of animal life. According to C. Hart Merriam's map, reproduced in Part I of this work,* the state of Connecticut is chiefly in the areas designated respectively as Alleghanian, or Humid Transition, possessed of vegetation and animals such as prevail in New York, Massachusetts, Rhode Island, and similar regions; and Carolinian, or Humid Upper Austral, possessed of vegetation and animals such as prevail in southern New Jersey. The latter area includes only the coastal margin of the state and the region extending for some distance up the valleys of the rivers. Besides these, there is in the more elevated northern sections of the state a touch of Canadian life, which is to be found at its best where the spruce tree flourishes. The distribution of the different species in the following pages is in some cases given in the above terms for the sake of brevity.

Finally, the succeeding pages are an endeavor to present to the people of Connecticut the ants, wasps, bees, etc., or Hymenoptera of their state, in such a way that those who so desire may find out the name of any species so far known to occur in the state and such facts about the same as are of general interest.

It must be remembered that this is the first attempt along these lines; and, considering that every day's systematic collecting in the state is almost sure to reveal a species new to the state, and quite likely to furnish a species entirely new to science, the shortcomings of this treatise are certainly inevitable. It is to be hoped that this treatise will stimulate an interest in these insects that will accomplish what is still to be done.

Most of the species considered were first placed on record for Connecticut by Norton, de Saussure, Bassett, Cresson, and Patton, all pioneers of entomology in America. Since these men gave their attention to Connecticut Hymenoptera, Wheeler, Ashmead, Brues, and others have added to our knowledge.

This introduction would be incomplete if no reference were made to certain of these investigators who have made Connecticut famous in the annals of their respective departments. Mr. H. F. Bassett specialized on the four-winged gall-flies as a recreation after his work as librarian in Waterbury, and made his town, as well as other localities in the state, the type localities of numerous species. Mr. Edward Norton, a dairyman and cattle-raiser of

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*Bull. No. 16, p. 21.

Farmington, very modestly made the study of the sawflies, four-winged parasitic flies, and cuckoo or gold wasps his recreation, and found many new species in the state. He furnished material to Mr. E. T. Cresson, the Philadelphia insurance expert and hymenopterist, and to Henri de Saussure, the great Swiss naturalist. The contributions made to the knowledge of Connecticut insects by these men were important, and were based chiefly upon material collected by Mr. Norton, who also translated and edited de Saussure's " Synopsis of American Wasps." Professor W. M. Wheeler, Professor of Economic Entomology, Harvard University, a prominent zoologist and an eminent student of ants, has made some of his remarkable investigations on the habits of ants at his summer home in Colebrook. Several type localities in the state have resulted from his studies.

The best collections of Connecticut Hymenoptera now in existence are that of the American Entomological Society at the Academy of Natural Sciences, Philadelphia, which contains types and paratypes of the species described from Connecticut by Norton, Cresson, and Bassett; and that of the Connecticut Agricultural Experiment Station, New Haven, where types of several of the recently described species may be found. Other material containing some types may be found at the United States National Museum, Washington, D. C.; the American Museum of Natural History, New York City; the Peabody Museum of Yale University, New Haven; the Museum of Comparative Zoology, Cambridge, Mass.; and the Museum of the Boston Society of Natural History.

ACKNOWLEDGMENTS.

Thanks should here be expressed to Doctors L. O. Howard and W. H. Ashmead, Mr. J. C. Crawford, and Mr. S. A. Rohwer of the Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.; Mr. J. H. Lovell, Waldoboro, Me.; Professor William Morton Wheeler, and Mr. C. T. Brues, Bussey Institution, Harvard University, Boston, Mass.; Professor H. T. Fernald and Mr. H. J. Franklin, Massachusetts Agricultural College, Amherst, Mass.; and Professor Alexander D. MacGillivray, University of Illinois, Urbana, Ill., all of whom have aided by determining material. Some of these specialists have prepared portions of this paper, and are given credit in connection with their work, as follows:

Professor A. D. MacGillivray, Superfamily Tenthredinoidea;
Professor W. M. Wheeler, Superfamily Formicoidea.
Mr. C. T. Brues, Superfamily Serphoidea or Proctotrypoidea, and Families Cosilidæ and Bethylidæ of the Superfamily Vespoidea;
Mr. S. A. Rohwer, Superfamilies Sphecoidea and Vespoidea (excepting groups in these superfamilies otherwise credited).

In the succeeding pages, wherever a species is known to have been originally described from Connecticut it is preceded by a *. The species preceded by a ° are those whose known distribution and habits indicate their probable presence in the state, though not yet collected.

BIBLIOGRAPHY.

For a more detailed account of the Hymenoptera than can be given here the reader is referred to the following publications, which can be found at most book stores or in public libraries:

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A Manual for the Study of Insects. J. H. and A. B. Comstock, vii + 701 pages, 6 plates, 797 figures. Comstock Publishing Co., Ithaca, N. Y., 1905.

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Bees and Bee-Keeping. F. R. Cheshire. 2 volumes. Volume I, vii + 336 pages, 8 plates, 71 figures; volume II, 652 pages, 127 figures, 1 plate. L. Upcott Gill, London, 1886.

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In addition to the works mentioned above, the reader is referred to the following publications issued by institutions and societies. These are not usually available at book stores, but can sometimes be procured from second-hand dealers, and may be found in the larger libraries. The first two are bibliographies, and contain a great many references to important papers on the Hymenoptera.

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A Monograph of the North American Proctotrypidæ. W. H. Ashmead. U. S. National Museum, Bull. No. 45. 472 pages, 18 plates. Washington, 1893.

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Insects Collected from the Flowers of Fruit Trees and Plants. W. E. Britton and Henry L. Viereck. Report of Connecticut Agricultural Experiment Station, pages 207-224. New Haven, Conn., 1905.

Directions for Collecting and Preserving Insects. U. S. National Museum, Bull. No. 67. xiii + 135 pages. Washington, 1909.

EXPLANATION OF COLLECTORS' INITIALS.

H. F. B.— H. F. Bassett, Waterbury. A librarian who was also a specialist on the four-winged gall-flies. He described many new species, and was the author of many published papers. Died June 28, 1902.

W. E. B.— W. E. Britton, New Haven. State Entomologist, and Entomologist of the Agricultural Experiment Station. The author of a number of papers on Connecticut insects. Has collected in nearly all parts of the state.

P. L. B.— P. L. Buttrick, New Haven. Employed temporarily to collect and mount insects at the Agricultural Experiment Station. Collected around New Haven.

A. B. C.— Alfred B. Champlain. For a year and a half Assistant in Entomology, Agricultural Experiment Station, New Haven. Is a specialist on Coleoptera, family Carabidæ, but has collected in other orders, in various sections of the state, particularly around New Haven and at Lyme.

S. N. D.— S. N. Dunning, Hartford. A lawyer who has also been a student of the bees and wasps. Most of his collecting was done near Hartford.

E. J. S. M.— E. J. S. Moore, New Haven. A student employed temporarily as assistant in the entomological department of the Agricultural Experiment Station. Collected chiefly around New Haven.

E. N.— Edward Norton, Farmington. A student of the saw-flies, describing many new species and publishing a large number of papers. Died April 8, 1894.

W. H. P.— William H. Patton, Hartford and Waterbury. Formerly gave much attention to the Hymenoptera, and is the author of many papers. Has collected in different parts of the state.

A. E. V.— Addison E. Verrill, New Haven. Professor of Zoology in Yale University. Has collected insects in various portions of the state, but chiefly around New Haven and at the Thimble Islands.

H. L. V.— Henry L. Viereck, Philadelphia. For more than a year Assistant in Entomology at the Agricultural Experiment Station at New Haven. Is the author of this and many other papers on the Hymenoptera. Has collected in nearly all sections of the state, but more especially around New Haven and along the shore.

B. H. W.— B. H. Walden, New Haven. Assistant in Entomology at the Agricultural Experiment Station. Author of "The Orthoptera of Connecticut." Has collected in nearly all parts of the state.

W. M. W.— William Morton Wheeler, Boston. Professor of Economic Entomology, Harvard University. A specialist on the ants. Has a summer home at Colebrook, Conn., and has made collections in the northern part of the state. Prof. Wheeler is the author of the Formicidæ in this bulletin.

H. W. W.— Henry W. Winkley, Branford. Rector of the Episcopal Church in Branford for several years. Collecting was done mostly around Branford.

STATISTICS.

Statistics of the Connecticut Hymenoptera as given in this paper, including the appendix, are as follows:

	Number of Families.	Number of Genera	Number of species and varieties		
			Listed.	Recorded from Conn.	Originally described from Conn.
Tenthredinoidea	7	113	533	196	60
Ichneumonoidea	16	179	728	374	205
Cynipoidea	3	26	149	85	56
Chalcidoidea	20	96	228	26	6
Serphoidea	8	67	181	23	4
Formicoidea	1	20	66	62	0
Chrysidoidea	1	6	20	8	1
Vespoidea	10	53	143	92	11
Sphecoidea	4	39	132	81	2
Apoidea	16	35	231	155	21
	86	634	2411	1102	366

Six new subgenera and one-hundred and twenty-six new species and varieties, mostly in the superfamily Ichneumonoidea, are described in this paper.

PARTS OF THE HYMENOPTERA EMPLOYED IN THE DESCRIPTION OF THE MEMBERS OF THIS ORDER.

Original diagrammatic drawings of representative species of the Hymenoptera, with the more important parts used in the classification of this order named thereon, are made use of in this work for the purpose of graphically presenting to the reader what it is believed could be but insufficiently expressed in the best word pictures of the same.

Of these drawings it needs to be said that the one of *Pteronidea ribesi* (Fig. 1), as well as those of the head and abdominal sockets of *Exochilum morio* (Fig. 2), will be of use in the working out of the meaning of the descriptions of any of the Hymenoptera, but especially with reference to the Tenthredinoidea; and that the drawing of *Chlorion* (*Ammobia*) *ichneumoneum* (Fig. 14) also serves a double purpose in that it graphically shows what parts are meant by many of the terms used in the elucidation of the differences between species, etc., in the Hymenoptera, but especially with reference to the Formicidæ or Formicoidea, Vespoidea, Sphecoidea, and Apoidea.

Parts peculiar to the other superfamilies, namely, the Ichneumonoidea, Chalcidoidea, and Serphoidea or Proctotrypoidea, are illustrated respectively by the drawings of the following: *Ichneumon centrator, Diastrophus nebulosus, Phasgonophora sulcata, and* (*Proctotrypes*) *Serphus caudatus.*

The names of the parts in the different drawings have been arranged so that the parts themselves might not be obscured by the appellations; thus, the names of the veins are given in connection with the wings of the right side of the body, and the names of the cells with the wings of the left side of the body, etc.

According to the latest nomenclature, the veins and cells of the wings have names different from those formerly used; hence the names of the old system, which are printed in the diagrams, together with their equivalents in the new or Comstock-Needham system, are given for comparison in parallel columns.*

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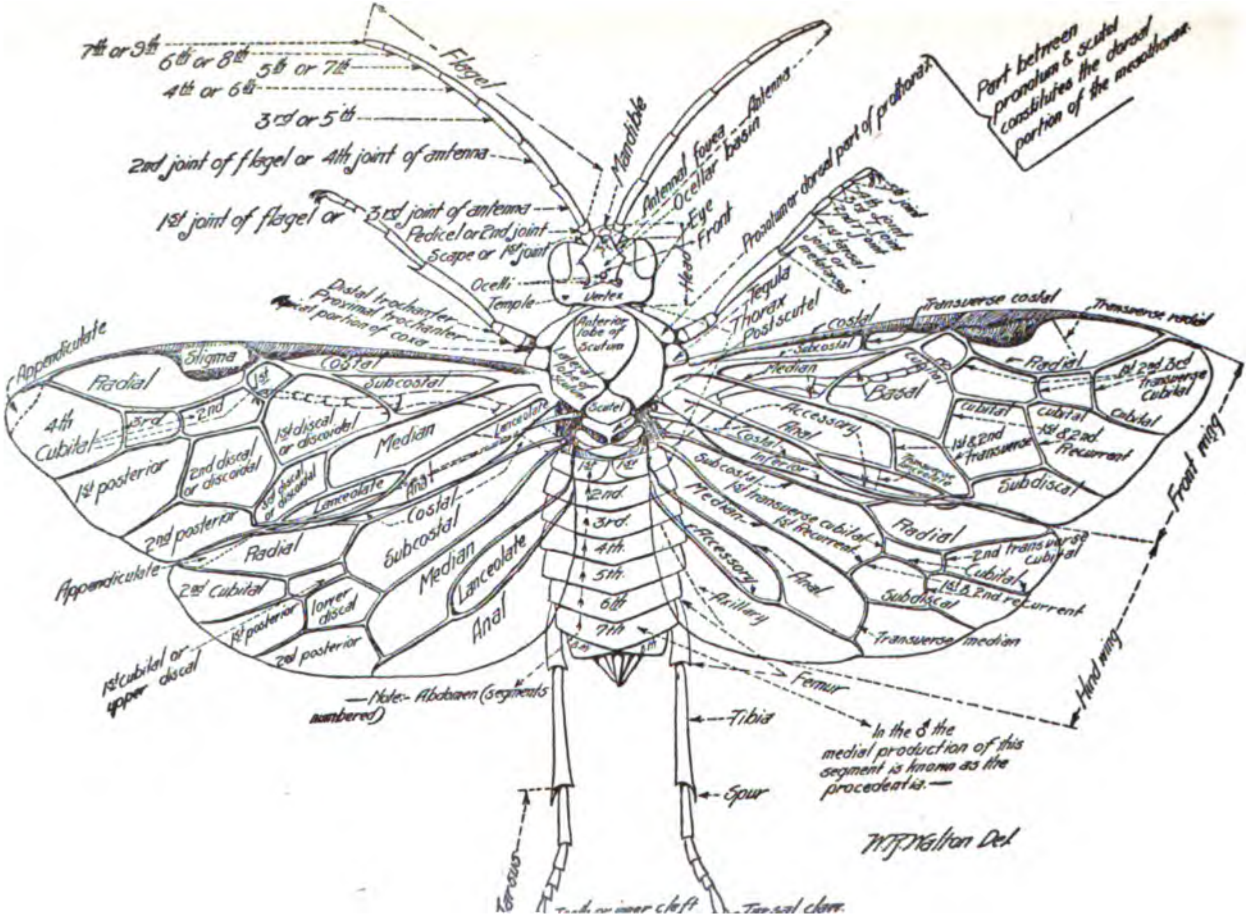
*For the statement of the Comstock-Needham nomenclature, in the Tenthredinoidea, the writer is indebted to Professor A. D. MacGillivray; in the other superfamilies, to Dr. J. Chester Bradley.


7th or 9th
6th or 8th
5th or 7th
4th or 6th
3rd or 5th
2nd joint of flagel or 4th joint of antenna
1st joint of flagel or 3rd joint of antenna
Pedicel or 2nd joint
Scape or 1st joint
Flagel
Mandible
Antennal fovea
Antenna
Ocellar basin
Eye
Front
Head
Ocelli
Temple
Vertex
Distal trochanter
Proximal trochanter
Apical portion of coxa
Prosolunar dorsal part of prothorax
Part between pronotum & scutel constitutes the dorsal portion of the mesothorax.
5th joint
4th joint
3rd joint
2nd joint
1st tarsal joint or metatarsus
Tegula
Thorax
Postscutel
Anterior lobe of Scutum
Lateral lobe of Scutum
Scutel
Appendiculate
Stigma
Radial
1st
2nd
3rd
4th Cubital
Costal
Subcostal
1st discal or discoidal
2nd discal or discoidal
3rd discal or discoidal
Median
Lanceolate
Anal
1st posterior
2nd posterior
Costal
Subcostal
Median
Lanceolate
Anal
Radial
Appendiculate
2nd Cubital
lower discal
1st posterior
2nd posterior
1st cubital or upper discal
—Note- Abdomen (segments numbered)
1st
1st
2nd
3rd
4th
5th
6th
7th
8th
8th
Costal
Transverse costal
Transverse radial
Subcostal
Median
Costal
Basal
Radial
1st 2nd 3rd transverse Cubital
Cubital
Cubital
Cubital
1st & 2nd transverse
1st & 2nd Recurrent
Accessory
Anal
Costal
Inferior
Transverse discoidal
Subdiscal
Subcostal
Median
1st transverse cubital
1st Recurrent
Radial
2nd transverse cubital
Cubital
1st & 2nd recurrent
Subdiscal
Accessory
Anal
Axillary
Transverse median
Front wing
Hind wing
Femur
Tibia
Spur
In the ♂ the medial production of this segment is known as the procedentia.—
Tarsus
or inner cleft
Tarsal claw
W.T.Walton Del

NOMENCLATURE OF WING PARTS IN THE DRAWING OF *PTERONIDEA RIBESI.*

Front Wings

OLD SYSTEM	COMSTOCK-NEEDHAM SYSTEM
Veins	*Veins*
Costal	Costa
Subcostal	$Sc + R + M$
Median	Cubitus
Anal	1st A + 2d A
Accessory	3d A and 2d A
Inferior	Hind margin (not a vein)
Radial	$Rs — R_3$
Cubital	$M — R_{4+5} + M_1$
Subdiscal	*m* and M_2
Transverse costal	Sc_1
“ radial	Radial cross-vein (*r*)
First transverse cubital	Radio-medial cross-vein (*r-m*)
Second “ “	Free part of R_5
Third “ “	“ “ “ R_4
Basal	Medio-cubital cross-vein (*m-cu*)
First recurrent	M_{3+4}
Second “	Transverse part of M_2
First transverse median	$M_4 + Cu_1$
Second “ “	M_3
Transverse lanceolate	Free part of 2d A
Cells	*Cells*
Costal	C and Sc_1
Subcostal	M
Median	$Cu + Cu_1$
Lanceolate	1st A + 2d 2d A and 1st 2d A Usually the wing area covered by 1st A, 2d A, and 3d A
Anal	3d A, or 1st 2d A + 3d A
Radial	R_{1+2}
Appendiculate	Appendiculate
First cubital	R
Second “	R_5
Third “	R_4
Fourth “	R_3
First discal	M_4
Second “	1st M_2
Third “	M_3
First posterior	M_1
Second “	2d M_2

Hind Wings

Veins	*Veins*
Costal	Costa
Subcostal	R + M
Median	Cubitus
Anal	Free part of 1st A
Accessory	Free part of 2d A
Radial	R_5 — R_3
Axillary	3d A
Cubital	M — R_{4+5} + M_1
Subdiscal	*m* and M_2
First transverse cubital	M
Second " "	R_4
First recurrent	Medio-cubital cross-vein (*m-cu*)
Second "	Transverse part of M_3
Cells	***Cells***
Costal	C + Sc_1
Subcostal	M
Median	M_3 + Cu + Cu_1
Lanceolate	1st A
Anal	2d A + 3d A
Radial	R_{1+2}
First cubital	R + R_{4+5}
Second "	R_3
Lower discal	M_4 + 1st M_2
First posterior	M_1
Second "	2d M_2

HYMENOPTERA.

Key to Superfamilies.

1. A deep constriction at the base of the first abdominal segment,* conspicuously separating the abdomen from the thorax 2
   No marked constriction at the base of the abdomen, the thorax and anterior abdominal segments being approximately equal in breadth........TENTHREDINOIDEA p. 25
2. First abdominal segment *(sometimes also the second) forming a lens-shaped scale or knot (petiole), strongly differentiated from the remaining abdominal segments (gaster) FORMICOIDEA p. 577

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* In all the Hymenoptera the segment which is morphologically the first abdominal segment (propodeum) is intimately fused with the thorax, of which it seems to be a part. In this work the general usage of descriptive writers is followed, and the segment which is apparently the first abdominal segment, though morphologically the second, is uniformly called the first abdominal segment.

Abdominal segments not strongly differentiated as petiole and gaster 3

3. Mesothorax anteriorly without the free prepectus shown in illustration of Chalcidoidea (Fig. 12) 4

Mesothorax anteriorly with a prepectus as shown in Fig. 12; usually winged, with venation reduced to a minimum as in Fig. 11; usually less than 3 mm. in length and metallic ... **CHALCIDOIDEA** p. 443

4. Tegulæ present, wings usually well developed, sometimes vestigial or lost 5

Tegulæ wanting, wings entirely absent, habitus respectively as in winged forms 9

5. Pronotum with its hind angles or tubercles tangent to a vertical line drawn tangent to anterior edge of tegulæ, touching or underlying tegulæ 6

Pronotum with its hind angles or tubercles always distinctly remote from tegulæ 12

6. Body not flea-like 7

Body flea-like; trochanters usually composed of a single joint; wings usually with a characteristic venation as shown in Fig. 10 ....**CYNIPOIDEA** p. 361

7. Wings with at least basal, median and submedian veins present, usually with venation well developed as shown in Fig. 8.. 8

Wings usually without veins or with only subcosta and part of radius present, rarely as in Fig. 13 or as in figure of *Pelecinus* in Packard's Guide ....**SERPHOIDEA** p. 529

8. Trochanters composed of two joints **ICHNEUMONOIDEA** p. 176

Trochanters composed of one joint 14

9. Body not flea-like, not compressed 10

Body flea-like, compressed as in winged forms **CYNIPOIDEA** p. 361

10. Body not densely hairy 11

Body densely hairy ....**VESPOIDEA** p. 606

11. First abdominal segment elbowed ..**ICHNEUMONOIDEA** p. 176

First abdominal segment not elbowed ... **SERPHOIDEA** p. 529

12. Hairs of dorsulum simple, not branched or plumose 13

Hairs of dorsulum branched or plumose ....**APOIDEA** p. 698

13. Abdomen with more than three segments visible, segments beyond third not hidden ....**SPHECOIDEA** p. 645

Abdomen with three segments visible, segments beyond third hidden ....**CHRYSIDOIDEA** p. 602

14. Cutting edge of mandibles turned inward, their tips meeting or overlapping when mandibles are flexed toward mouth **VESPOIDEA** p. 606

Cutting edge of mandibles turned outward, their tips usually neither meeting nor overlapping when mandibles are flexed toward mouth ....**ICHNEUMONOIDEA** p. 176

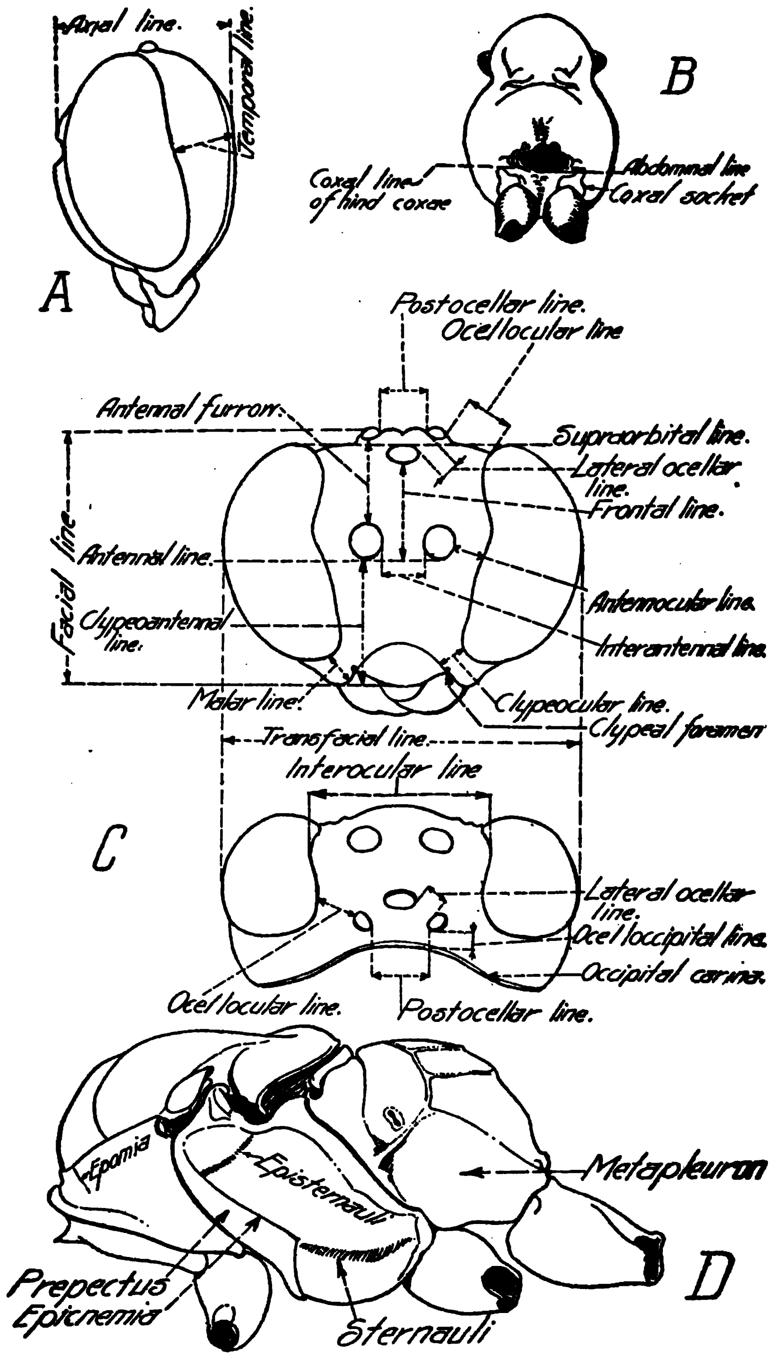

FIG. 2. *A*, Side view of head, *B*, rear view of thorax and propodeum, *C*, front and dorsal views of head, *Therion morio; D*, side view of thorax, Ichneumonoidea.

TENTHREDINOIDEA*.

By Alexander Dyer MacGillivray.

This superfamily is differentiated from the other superfamilies of Hymenoptera by having the cephalic end of the abdomen as broad where it is joined to the thorax as the caudal end of the thorax, never constricted into a narrow pedicel; by having the first abdominal segment joined to the abdomen, instead of being closely anchylosed to the thorax and bearing a pair of spiracles, and usually with its tergum longitudinally divided at middle; by the retention in practically all the species of the base of the radial sector; and by the presence in many of the species of more than one anal cell.

Their larvæ either feed externally on the leaves of plants, within their stems, or within the trunks of trees. They can be distinguished from the larvæ of other Hymenoptera by the presence of prominent abdominal prolegs, and from the larvæ of the Lepidoptera, with which they are most likely to be confused, by the presence of only a single ocellus on each side of the head.

The most useful characters for distinguishing the species of Tenthredinoidea are found on the head capsule and on the ovipositor of the female.

The ovipositor of the female consists of two parts, an external flattened plate on each side, and two median flattened, pointed, yellowish plates located between the external plates. The external plates are known as the saw-guides. The variation in the shape of the three exposed margins, upper, lower, and apical, of the saw-guides is usually characteristic for a given species. The yellowish, chitinized plates located between the saw-guides are the saws. The distal end and ventral margin of each saw are usually denticulate. The shape and arrangement of the denticles or teeth are also usually characteristic for a given species or group of species.

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* Contributions from the Entomological Laboratories of the University of Illinois, No. 50.

The variation in the shape of the head and in its sculpture is of the greatest importance for differentiating species, because it is usually characteristic for both sexes. In order to condense the descriptions and make them more accurate, names have been applied to the various head regions and their boundaries. They are as follows:

Tentorial Foveæ.— The tentorial foveæ are the pit-like openings situated between the antennal sockets and the dorsal margin of the clypeus. They mark the points of invagination for the anterior arms of the tentorium. They vary from mere pits to flaring, trumpet-shaped holes.

Antennal Furrows.— The antennal furrows, when complete, extend from the tentorial foveæ along the lateral margin of the antennal sockets, thence across the cephalic aspect of the head to near the lateral ocelli, thence across the dorsal aspect, and finally end on the caudal margin just below the ridge separating the dorsal and caudal margins of the head. While the antennal furrows are frequently complete, yet certain sections are sometimes obsolete, so that it is desirable to refer to different sections of the antennal furrows.

Vertical Furrows.— The vertical furrows are the portions of the antennal furrows situated on the dorsal aspect of the head. They extend from near the lateral ocelli to the caudal aspect of the head. The vertical furrows are rarely wanting and are usually more distinctly marked than the other parts of the antennal furrows.

Lateral Foveæ.— The portions of the antennal furrows extending between the vertical furrows and the antennal sockets are sometimes completely wanting. The antennal furrows, in many cases, instead of being entirely obsolete, are represented on each side of the head by a distinct pit. These pits are known as the lateral foveæ. They are located near the antennal sockets and may be connected with them by a short furrow. They vary considerably in size, shape, and location.

Ocellar Furrow.— The ocellar furrow is a transverse furrow extending between the ends of the vertical furrows near the dorsal margin of the lateral ocelli. It is frequently confluent with the space around the lateral ocelli.

Interocellar Furrow.— The interocellar furrow is a short depressed line or space extending from the middle of the ocellar furrow to the median ocellus. Adjacent to the median ocellus, this furrow flares out, and is frequently a depressed area surrounding the ocellus.

Postocellar Area. — The postocellar area is the region on the dorsal aspect of the head bounded by the ocellar furrow, the vertical furrows, and the caudal margin of the head.

Frontal Crest.— The frontal crest is an elevation extending across the head just above the antennal sockets. It separates the region between the antennæ from the region above it. The frontal crest is usually limited on each side by the antennal furrows, but it may extend across the antennal furrows nearly to the margin of the compound eyes. It is frequently interrupted at middle by the median fovea, when it is said to be broken.

Antennal Groove.— The antennal groove is the curved portion of the antennal furrow extending on each side of the head between the tentorial fovea and the frontal crest around the lateral margin of the antennal sockets.

Supraclypeal Area.— The supraclypeal area is the region between the antennal sockets, the clypeus, and the frontal crest. It may be flat, uniformly convex, carinated, or concave.

Median Fovea.— The median fovea is a rounded or angular pit located near the middle of the ventral margin of the frontal crest. The median fovea is figured and described by some authors as the antennal fovea.

Antennal Foveæ.— The antennal foveæ are the depressed areas surrounding the antennal sockets. The antennal furrows and the lateral foveæ are frequently connected with the antennal foveæ.

Frontal Area.— The frontal area comprises the region of the head located between the antennal furrows, the frontal crest, and the ocellar furrow.

Ocellar Basin.— The depressed area surrounding the median ocellus is frequently continued as a concave area to the frontal crest. The interocellar furrow is frequently expanded so as to occupy most of the space between the lateral ocelli. This concave area, occupying the median portion of the frontal area, is known as the ocellar basin. The ocellar basin varies greatly in form and extent in the different families and subfamilies.

Frontal Furrow.— The frontal furrow is a well marked depression occurring on the meson of the ocellar basin of many species. It may be limited to a pit or fovea, or it may extend from the median ocellus to the frontal crest. It may not only vary in length, but may vary in position and be located anywhere in the space between the median ocellus and the frontal crest. There is also considerable variation in the width of the furrow.

Malar Space.— The malar space is the area on each side of the head included between the proximal end of the mandible and the ventral end of the compound eye.

Key to Families.

1. Front wings with free part of R_3 present; antennæ always with more than three segments, third segment of antennæ usually longer than all the following segments together XYELIDÆ p. 29

Front wings with free part of R_3 always wanting; antennæ with three or more segments, third segment never as long as all the following segments together; if third segment be long, antennæ consisting of only three segments 2

2. Front wings with base of subcosta always present; pronotum transverse and scarcely emarginate behind .... PAMPHILIIDÆ p. 32

Front wings with base of subcosta wanting, at most represented only by a pale indistinct line; subcosta usually represented by the free part of Sc_1, which appears like a cross-vein in cell between costa and R + M; pronotum transverse but frequently so deeply emarginate behind that the mesal portion is concealed by the head 3

3. Front wings with radial cross-vein received in cell R_4, very rarely in cell R_5; medio-cubital cross-vein joined to R + M or to M; if joined to M, first abscissa of M not more than one-sixth the length of the cross-vein; ovipositor in form of a saw, exserted or retracted; anterior tibiæ with two apical spurs............TENTHREDINIDÆ p. 41

Front wings with radial cross-vein received in cell R_5, rarely in cell R_4; if in cell R_4, medio-cubital cross-vein joining media distinctly distad of radius and subequal in length to first abscissa of media; ovipositor in form of a saw or borer and usually exserted; anterior tibiæ with one apical spur 4

4. Front wings with first abscissa of M_2 present; antennæ inserted between eyes above base of clypeus, with bases of antennæ fully exposed 5

Front wings with first abscissa of M_2 wanting; antennæ inserted below level of eyes at base of clypeus under a transverse ridge of the front, their bases concealed .... ORYSSIDÆ p. 175

5. Front wings with a distinct cell between costa and Sc + R + M; medio-cubital cross-vein subequal in length to first abscissa of media 6

Front wings without a cell between costa and Sc + R + M; medio-cubital cross-vein from three to five times as long as first abscissa of media ....CEPHIDÆ p. 172

6. Front wings with free part of Sc_1 always present; first abscissa of media extending lengthwise of wing; the last abdominal tergite not ending in a triangular or lanceolate process ....XIPHYDRIIDÆ p. 168

Front wings with free part of Sc_1 always wanting; first abscissa of media extending crosswise of wing; last abdominal tergite ending in a triangular or lanceolate process ....SIRICIDÆ p. 169

XYELIDAE.

Key to Genera.

1. Front wings with free part of M arising a considerable distance beyond point of union of R + M and Sc_2; hind wings with free part of R_2 wanting; claws with a minute tooth-like protuberance at base or with a long slender seta at apex 2

Front wings with free part of M arising distinctly before point of separation of R and Sc_2; hind wings with free part of R_2 present; claws cleft or with a large tooth within at apex 3

2. Front wings with Sc not coalesced with R + M, so that free part of Sc_2 appears like a cross-vein between apex of Sc and R + M ....Pleuroneura p. 30

Front wings with Sc coalesced with R + M, so that the free part of Sc_2 is obliterated ....Xyela p. 30

3. Front wings with free part of R subequal in length to R + Sc_2 4

Front wings with free part of R distinctly shorter than R + Sc_2, frequently less than one-half the length of R + Sc_2 5

4. Claws with a large erect tooth within at middle .... **Odontophyes** p. 30

Claws cleft, two parts of cleft parallel........**Megaxyela** p. 31

5. Clypeus triangular in outline, median portion two or three times as long as lateral portions; claws cleft, two parts of cleft parallel ....**Paraxyela** p. 31

Clypeus not triangular in outline, median portion but little if any longer than lateral portions; claws with an erect tooth at middle 6

6. Front wings with free part of Sc_2 almost twice as long as free part of Sc_1; Sc_1 much more oblique than Sc_2; cell R_2 usually divided by a supernumerary cross-vein; clypeus much broader at middle than at lateral emarginations .... **Protoxyela** p. 31

Front wings with free part of Sc_2 subequal in length with free part of Sc_1; Sc_1 and Sc_2 inclined at about the same angle; cell R_2 never divided by a supernumerary cross-vein; clypeus only slightly if at all broader at middle than at lateral emarginations ....**Macroxyela** p. 31

Pleuroneura Konow.

°**P. brunneicornis** Rohwer.

Body black, with the mandibles, a line on the pronotum, and the tegulæ, pallid; clypeus, labrum, palpi, legs, venter, and three apical abdominal segments, rufo-fulvous; hind tibiæ infuscated; clypeus truncate with a triangular tooth at middle; antennal furrows indistinct above the middle of the head; no fovea at side of lateral ocelli. Length 6 mm.

Xyela Dalman.

°**X. minor** Norton.

Body yellowish, with indistinct or subdistinct brownish spots on the three basal segments of the antennæ, a parenthesis-shaped spot each side of the ocelli, two spots on each lateral lobe of the mesonotum; third segment of the antennæ distinctly shorter than all the following segments together and longer than the first and second together; ovipositor slender, longer than the abdomen; wings elongate, projecting one-half their length beyond the apex of abdomen. Length 4 mm. Larva feeds on staminate flowers of *Pinus*.

Odontophyes Konow.

°**O. avingrata** (Dyar).

Body steel blue, with the following parts yellow: the labrum, bases of the mandibles, palpi, bases of the antennæ, tips of the anterior and middle femora, trochanters, and four apical segments of the posterior tarsi; head roughened with large, closely placed punctures; abdomen iridescent with fine transverse wavy striations. Length 13 mm. Larva resembling a bird's dropping, feeds on the young leaves of hickory and butternut.

Megaxyela Ashmead.

°**M. major** (Cresson). *Xyela major* Cresson.

Body ferruginous, with black and yellow markings; posterior tibiæ broadly expanded and flattened, covered with setæ which form a brush along the ventral side. Length 10 mm. Larva feeds on hickory.

Paraxyela MacGillivray.

°**P. tricolor** (Norton). *Xyela tricolor* Norton.

Body steel blue, with the following parts white: spots at the insertion of the antennæ, nasus, labrum, mandibles, palpi, and edges of the ventral segments; the following parts black: edge of labrum, tips of posterior femora, tibiæ, and tarsi; legs rufous. Length 8 mm.

Protoxyela MacGillivray.

°**P. ænea** (Norton). Howard, Insect Book, pl. xiii, Fig. 5.

Body bronze-black with the following parts rufous; first segment of antennæ, supraclypeal area, clypeus, labrum, mandibles, legs including the coxæ, venter at apex, and apical two-thirds of saw-guides; abdominal segments beyond the basal plates with a fine apical white margin. Length 7 mm.

Macroxyela Kirby.

Key to Species.

1. Head with a flat depressed area in front of median ocellus, never crossed by the median fovea 2
   Head, if with a depressed area in front of median ocellus, always broken by the median fovea, which extends to the median ocellus 4
2. Median fovea represented by a linear smooth spot only slightly, if at all, depressed below the surface of the front; body black, with clypeus, labrum, malar space, supraclypeal area, basal plates at sides, abdomen beyond the basal plates, and legs rufous. Length 8 mm. ....bicolor

Median fovea not linear and distinctly depressed below the surface of the front 3

3. Median fovea a broad, flat, indistinct depressed area, more distinct near the median ocellus; saw-guides strongly convex above on the basal half and straight or slightly convex below; body rufous, with a spot about the ocelli, a spot near the base of wings, and the base of abdomen above, more or less black. Length 8 mm. ....**obsoleta**

Median fovea a distinct, narrow, elongate, diamond-shaped depression, flat on the bottom; saw-guides convex above on basal half and straight below; body rufous, with two spots on lateral lobes of mesonotum and the postscutellum black. Length 8 mm. ....**distincta**

4. Median fovea a wedge-shaped depression, narrowed near the median ocellus, with polished, sloping walls; saw-guides strongly convex on basal two-thirds above and almost straight below; body rufous, with antennæ beyond the second segment, a spot about the ocelli, a spot above the base of each antenna, a spot on the apex of the median lobe of the mesonotum, two spots on each lateral lobe, and the two basal tergal segments black. Length 9 mm. **ferruginea**

Median fovea vase-shaped, a semicircular, slanting depression adjacent to the median ocellus, broadly boat-shaped on the middle of the front, the two parts connected by a narrower portion with high bounding walls; saw-guides moderately convex on basal two-thirds above and straight below; body rufous, with usually a spot about the ocelli, and two spots on each median lobe of mesonotum black. Length 8 mm. ....**infuscata**

°**M. bicolor** MacGillivray.

°**M. obsoleta** MacGillivray.

°**M. distincta** MacGillivray.

°**M. ferruginea** (Say). *Xyela ferruginea* Say.

°**M. infuscata** (Norton). *Xyela infuscata* Norton. Larva feeds on the leaves of elm.

PAMPHILIIDÆ.

Key to Genera.

1. Claws cleft, the two rays subequal in length; hinder margin of posterior orbits with a distinct fine carina 5

Claws with a small median or submedian erect tooth 2

2. Anterior tibiæ with a lateral spur before the apex 3

Anterior tibiæ without a lateral spur before the apex 4

3. Hind margin of posterior orbits without a carina .... **Acantholyda** p. 33

Hind margin of posterior orbits with a distinct, fine carina **Itycorsia** p. 33

4. Front wings with medio-cubital cross-vein joined to media distinctly beyond its point of separation from radius ...... **Cephaleia** p. 35

Front wings with medio-cubital cross-vein joined to media at its point of separation from radius ....**Cænolyda** p. 36

5. Front wings with free part of Sc_1 present, cells C and Sc_1 distinct 6

Front wings with free part of Sc_1 wanting so that cells C and Sc_1 are united ....**Neurotoma** p. 37

6. Antennæ with third segment not or scarcely longer than fourth, at least always shorter than segments four and five united ....**Pamphilius** p. 37

Antennæ with third segment as long as or longer than segments four and five united ....:.......**Anoplolyda** p. 39

Acantholyda Costa.

°**A. marginiventris** (Cresson).

Tergum black, with a narrow lateral white or pinkish margin; antennæ black; legs black, except the anterior tibiæ in front; head black with the clypeus white; a spot between the base of the antenna and the eye, a pair of spots in front of the ocelli, a pair of lunate marks behind the ocelli, a narrow band from the eyes to the occiput, and the outer orbits, white; a triangular spot on the median lobes of the mesonotum, white. Length 15 mm.

°**A. bicolorata** (Norton).

Tergum honey yellow, with the two apical segments black; antennæ black; legs black; head brown, with a spot at the base of each antenna, a triangular spot above each eye, one about the ocelli, and a large spot on the vertex, black. Length 12 mm.

Itycorsia Konow.

Key to Species.

1. Pleuræ entirely black 2

Pleuræ either with a broad oblique pale spot or entirely pale 3

2. Body black, with the following parts rufous: head, except labrum, a spot around bases of antennæ, mandibles, greater part of lateral lobes of mesonotum, scutellum, postscutellum, and anterior tibiæ and tarsi; lateral margin of abdominal segments with a fine yellow line; wings infuscated. Length 12 mm. ....**brunniceps**

   Body, in female, black, with the following parts yellowish white: spot on bases of mandibles, spot on cheeks, narrow line from the caudal end of eyes to the occiput where it expands and extends along the caudal margin of the posterior orbits to near their middle, two ovate spots on vertex, a narrow line on pronotum, a line on suture between median and lateral lobes, a spot on each lateral lobe, and an irregular spot on the lateral margin of each abdominal segment; tibiæ and anterior tarsi rufous; wings hyaline, with a clouded spot extending across wings behind the stigma. Male differs in having the antennæ usually rufous at middle, a yellowish spot at caudal end of each eye, mandibles in great part yellow, spots on abdominal segments limited to a line, and all the tibiæ and tarsi yellowish rufous. Length 16 mm. ....**maculiventris**

3. Pleuræ and sternum black, with an oblique pale mark on pleuræ; legs in part marked with black. 6

   Pleuræ and sternum wholly rufous or ochraceous; legs entirely rufous or ochraceous 4

4. Head with the summit of the declivous area at the base of antennæ broadly rounded; body rufous, with tips of antennæ infuscated, and tergum, except a line along the lateral margin, black; median fovea an elongate pit situated midway between the bases of antennæ and ocelli; basal segment of antennæ rufous. Length 14 mm. ......**ochrocera**

   Head with the summit of the declivous area at the base of antennæ elevated into a distinct transverse ridge; basal segment of the antennæ marked with black 5

5. Head with the postocellar area elevated above ocelli; eye margin angulated opposite ocelli; median fovea a deep depression with distinct boundaries, nearer to the ocelli than to the bases of antennæ; head with indefinite black lines, more pronounced in region of ocelli; median lobe of mesonotum, scutellum and metathorax in part, and a narrow band on the base of abdominal segments, black. Length 14 mm. ....**angulata**

   Head with postocellar area not elevated above ocelli; eye margin not angulated opposite ocelli; median fovea an elongate slit nearer to the ocelli than to the bases of antennæ; head with indefinite black lines in the region of ocelli; median lobe at base, lateral lobes at middle, base of scutellum, metathorax in part, and a narrow transverse band on the base of each abdominal segment, black. Length 14 mm. ....**discolor**

6. Large yellow spot laterad of the bases of antennæ smooth without punctures; clypeus and labrum yellow, produced at middle into a distinct spearhead-shaped projection, rarely punctate and if so bearing white setæ; head and thorax with the usual yellow spots; legs all yellow or yellowish-rufous with the femora black above; abdomen almost entirely rufous or with a narrow black line on the caudal margin of the segments, in some specimens the black bands expanded onto the cephalic part of the next segment until some of the segments are almost entirely black. Length 13 mm. ....**luteomaculata**

Large yellow spot laterad of the bases of antennæ completely covered with punctures, each puncture bearing a black seta; labrum and clypeus yellow, produced at middle into a triangular-shaped projection and distinctly punctate, the punctures bearing black setæ; head and thorax with the usual yellow spots; legs yellow or yellowish-rufous with all the femora black above and all with more or less black beneath; abdomen black above with a narrow yellow lateral margin. Length 14 mm. ....**albomarginata**

°**I. brunniceps** (Cresson). *Lyda brunniceps* Cresson.

°**I. maculiventris** (Norton). *Lyda maculiventris* Norton.

I. ochrocera (Norton). *Lyda ochrocera* Norton. Wallingford, 1 June, 1910 (D. J. Caffrey), 13 July, 1911 (J. K. Lewis); Stonington, 15 June, 1908 (W. E. B.).

I. angulata MacGillivray. Manchester, 20 May, 1910 (A. B. C.); Wallingford, 7 July, 1911 (J. K. Lewis).

°**I. discolor** (Cresson).

***I. luteomaculata** (Cresson). *Lyda luteomaculata* Cresson. Torrington (R. Hochstein).

***I. albomarginata** (Cresson). *Lyda albomarginata* Cresson. New Haven, 24 June, 1905 (H. L. V.).

Cephaleia Panzer.

Key to Species.

1. Pleuræ entirely black 2
   Pleuræ with a prominent oblique pale mark 3

2. **Head black, with the following parts ferruginous: spot on the side of face and on the apical middle of clypeus, broad line on cheeks, and two spots behind ocelli; antennæ in great part pale yellow; wings hyaline, with a fuscous band beneath stigma; abdomen violaceous black, transversely banded at middle with yellowish ferruginous. Length 15 mm. .... fascipennis**

   Head rufous, with a black spot around ocelli, extending to the bases of antennæ; tegulæ and immediate adjacent parts of pronotum and wings ferruginous; body, including wings, violaceous black. Length 18 mm. .... frontalis

3. **Scutellum yellow; head and thorax black, with the usual straw-yellow markings; antennæ black; abdomen black, with a rufous or honey-colored transverse band on segments two to four and the tip of the anal segment of the same color; wings faintly clouded. Length 11 mm. ...... canadensis**

   Scutellum black 4

4. **Head and thorax blackish, with the usual yellow spots; antennæ varying from yellow to blackish fuscous; abdomen entirely luteous or with an irregular median blackish band; legs luteous, front and middle femora black above, posterior entirely black. Length 11 mm. .... mathematica**

   Head and thorax black, with clypeus and three elongate spots extending from it between the antennæ and along the inner orbits, outer orbits, tegulæ, and an oblique pleural mark, yellow; abdomen black with the lateral margin and the venter more or less yellow; legs wholly pale, rufous or ochreous. Length 11 mm. .... distincta

°C. **fascipennis** (Cresson).

°C. **frontalis** (Westwood).

°C. **mathematica** (Kirby). *Pamphilius mathematicus* Kirby.

°C. **canadensis** Norton.

°C. **distincta** MacGillivray.

Cænolyda Konow.

°C. **semidea** (Cresson). *Lyda semidea* Cresson.

Head and thorax luteous or brownish, with the usual yellow-colored spots faintly indicated; antennæ luteous beyond first segment; abdomen entirely luteous or brownish; legs luteous, with the basal three-fourths of the femora rufous, fuscous, or black; wings hyaline, veins luteous or brownish. Length 12 mm.

Neurotoma Konow.

***N. fasciata** (Norton). Howard, Insect Book, pl. xiv, Fig. 15.

Body in female black, with the following parts yellow: a shield-shaped spot between the antennæ, tegulæ, scutellum, postscutellum, a triangular spot on the caudo-lateral angles of the fourth to the sixth tergal segment, and legs except coxæ and basal half of femora; wings fuliginous, front wings clear at apex. Male differs in having scutellum and postscutellum black, and legs beyond coxæ entirely yellow. Length 12 mm. Larva feeds on cherry.

Connecticut (E. N.).

°**N. inconspicua** (Norton).

Body dull black, with tegulæ yellow and mandibles and legs beyond the coxæ rufous; tarsi black; wings hyaline, with a faint fuscous band behind the stigma. Length 9 mm. Larva feeds on cherry.

Pamphilius Latreille.

Key to Species.

1. Antennæ white beyond the first segment; head and thorax black, with the usual pale markings; abdomen black, with a white lateral margin and a transverse band on the middle of the four apical segments; legs yellow, with anterior and middle coxæ, anterior trochanters, basal half of anterior and middle femora, and apices of their tibiæ and tarsi, posterior coxæ in part, and apices of their tibiæ and tarsi, black; wings hyaline. Male differs from female only in having the spots on head and thorax smaller and the black on legs more pronounced. Length 10 mm. ......**semicinctus**

Antennæ entirely black, yellow or rufous beyond the middle 2

2. Head and thorax in female luteous with black markings; abdomen luteous with a longitudinal black or fuscous band on each side of tergum within the margin; legs entirely luteous, darker toward apex; wings hyaline. Male differs in having disk of the head, thorax, and abdomen black with yellow spots; posterior tibiæ and all the tarsi fuscous. Length 9 mm. ....**ocreatus**

Head and thorax black, with yellow markings............. 3

3. Abdomen rufous beyond the first segment................ 5

Abdomen black, with the third and fourth segments rufous 4

4. Head with a strongly elevated V-shaped ridge behind the median ocellus; body black, with declivous part of the

head, mesal surface of the basal segment of antennæ, apical half of antennæ, genæ, a line on the outer orbits adjacent to the eyes, a spot on the posterior orbits, tegulæ, and the legs below the coxæ, except the posterior tibiæ, white; abdomen with segments three and four entirely, the basal half of five, and a line on six, rufous. Length 11 mm. **transversus**

Head not with a strongly elevated V-shaped ridge behind the median ocellus; body black, with mandibles, declivous part of the head, a line on the posterior orbits, a spot on each side of the postocellar area, a spot on each side on the caudal margin of head, tegulæ, scutellum, postscutellum, and legs beyond the coxæ, yellow. Length 8 mm. ....**rufocinctus**

5. Pleuræ with a pale mark; body black, with clypeus, posterior orbits, genæ, a broad band from the middle of the eye to the occiput, two prominent, triangular-shaped dilations on the inner side near the eye, two parenthesis-shaped spots near the postocellar area, three minute spots on the front, tegulæ, V-spot, scutellum, postscutellum, front and middle legs, and posterior trochanters and femora, yellow; mandibles, posterior tibiæ and tarsi, and abdomen beyond the basal plates, rufous. Length 9 mm. **persicus**

Pleuræ without a pale mark 6

6. Labrum with a small median tooth 7

Labrum broadly rounded without a median tooth; ocellar basin sharply defined, a V-shaped ridge behind median ocellus and two broad mounds in front; body in female black, with apical half of antennæ, clypeus, lower half of the outer orbits, a line on the genæ adjacent to the eyes, a bifid dilation on the inner orbits extending as a line to the occiput, its inner margin extending to the vertical furrows, ridges about the ocellar basin, a spot on each vertitical furrow, tegulæ, a line on the collar, the V-spot, scutellum, postscutellum, and the legs below the knees, white; abdomen rufous beyond the basal plates. Male differs in having the area in front of the frontal crest and the basal segment of antennæ yellow, spots on the orbits and vertex wanting. Length 8-10 mm. ....**dentatus**

7. Median fovea wanting; ocellar basin strongly defined; body black, with apical half of antennæ, clypeus, base of mandibles, lower half of posterior orbits, area around ocellar basin, a spot on each vertical furrow, a line from the middle of the inner orbits to the occiput (enlarged at occipital end), tegulæ, prosternum, and legs beyond the

coxæ, except posterior tibiæ and tarsi, yellow; abdomen reddish beyond the first segment. Length 10 mm. .... **ocellatus**

Median fovea open and elongate; ocellar basin not sharply defined; body black, with apex of the clypeus, genæ, three spots about ocelli, a line from the inner orbits to the eyes, a spot on the vertical furrows, apical third of the antennæ, tegulæ, scutellum, legs below coxæ, except the posterior tibiæ, pale yellow; abdomen rufous beyond the first segment. Length 7.75 mm. ....**rubi**

°**P. semicinctus** (Norton). *Lyda semicincta* Norton.

P. ocreatus (Say). *Lyda ocreata* Say. Howard, Insect Book, pl. xiv, Figs. 4 and 9. Connecticut (Norton); New Haven, 21 May, 1910 (A. B. C.). Larva a solitary feeder on *Corylus*.

°**P. transversus** MacGillivray.

°**P. rufocinctus** (Cresson). *Lyda rufocincta* Cresson.

***P. persicus** MacGillivray. Yalesville, Meriden, Wallingford, Middlefield, Durham, North Haven, New Haven, Hamden, Cheshire, Farmington (B. H. W.); Yalesville, June (W. E. B.). Larva feeds on peach.

For a full account of this insect and its appearance as a pest, see 7th Report State Entomologist, in Report for 1907-8 of Connecticut Agricultural Experiment Station, New Haven, p. 285.

***P. dentatus** MacGillivray. Hamden, 24 May, 1910, New Haven, 30 May, 1911 (B. H. W.); Wallingford, 8 June, 1911 (B. H. W. and D. J. Caffrey). Larva feeds on blackberry. See Report of Connecticut Agricultural Experiment Station for 1912, p. 236.

°**P. ocellatus** Rohwer.

°**P. rubi** Rohwer. Larva feeds on blackberry.

Anoplolyda Costa.

Key to Species.

1. Pleuræ with a large oblique pale stripe.................... 2
   Pleuræ black 4
2. Abdomen rufous at least beyond first segment.............. 3
   Abdomen black, except a rufous spot on the first and the most of the second and third segments of the tergum;

legs black to the middle of femora, and beyond the middle of femora yellow-red; antennæ black; scutellum and postscutellum yellow; head yellow in front of ocelli except a black line above each antenna; wings hyaline. Length 7 mm. .... **excavata**

3. Antennæ black at base, yellow at apex; body black, with head and thorax with the usual yellow markings; legs, except coxæ and apical three-fourths of the hinder tibiæ, pale yellow; wings hyaline. Length 10 mm. ...... **luteicornis**

Antennæ black; body black, with head and thorax with the usual yellow markings; legs, except posterior femora, yellow; wings hyaline. Length 12 mm. .... **pallimacula**

4. Scutellum black; head yellow, with the area behind and including ocelli and between the antennal furrows, black; pronotum, tegulæ, and (in female) legs beyond the coxæ, yellow; abdomen black with rufous spot covering the disk of second to fourth segments of tergum and venter; antennæ black; wings strongly infuscated. Male differs in having the apex of the posterior tibiæ black. Length 13 mm. .... **plagiata**

Scutellum pale 5

5. Abdomen rufous beyond the first segment.................. 6

Abdomen marked with rufous at middle, black at apex...... 7

6. Antennæ black; mesal projecting spot on the inner margin of eye pointed at apex and not bifid; anterior ocellus entirely surrounded by yellow; head and thorax with the usual pale markings; legs yellow beyond the middle of coxæ; wings hyaline; the basal half of stigma yellow. Length 12 mm. .... **quebecensis**

Antennæ white beyond the middle; mesal projecting spot on the inner margin of eyes deeply bifid at apex; anterior ocellus not entirely surrounded by yellow, interrupted by a furrow on each side; head and thorax with the usual pale markings; legs yellow beyond coxæ, except posterior tibiæ which are black; wings hyaline; stigma black. Length 12 mm. .... **scripta**

7. Abdomen black, with a rufous spot on the disk of tergal segments one to four; head and thorax with the usual pale markings, except that those on the head are reduced to fine lines; legs beyond coxæ, greenish yellow; antennæ black; wings hyaline, veins and stigma black. Length 9 mm. **perplexa**

Abdomen black at base and apex with a transverse rufous band at middle; legs beyond coxæ entirely yellow; transverse ridge in front of ocelli and vertex deeply impressed by the antennal furrows; head and thorax with the usual pale markings; second segment of the antennæ about twice as long as broad; wings yellowish-hyaline; antennæ black. Length 9 mm. .... **rufofasciatus**

°**A. excavata** (Norton).

***A. luteicornis** (Norton). Farmington (E. N.).

A. pallimacula (Norton). Howard, Insect Book, Pl. xii, Fig. 6. Farmington (E. N.).

°**A. plagiata** (Klug). Howard, Insect Book, Pl. xiv, Fig. 22.

°**A. quebecensis** (Provancher).

A. scripta (Say). Farmington; New Haven, 4 June, 1911, Hamden, 2 June, 1911 (A. B. C.), 14 June, 1911 (W. E. B.).

°**A. perplexa** (Cresson).

A. rufofasciatus (Norton). Connecticut (E. N.).

TENTHREDINIDAE.

Key to Subfamilies.

1. Front wings with second anal cell contracted at middle 2
   Front wings with second anal cell not contracted at middle 5
2. Front wings with free part of second anal vein present 3
   Front wings with free part of second anal vein wanting. SELANDRIINÆ p. 65
3. Radial cross-vein present; antennæ never with more than nine segments 4
   Radial cross-vein wanting; antennæ always with more than nine segments ....DIPRIONINÆ p. 43
4. Front wings with free part of vein R_3 present and cells R_3 and R_4 therefore separate 5
   Front wings with free part of vein R_3 wanting, so that cells R_3 and R_4 are united ....DOLERINÆ p. 68
5. Front wings with medio-cubital cross-vein and free part of M_{3+4} parallel ....EMPHYTINÆ p. 45
   Front wings with medio-cubital cross-vein and free part of M_{3+4} strongly divergent behind ....PHYLLOTOMINÆ p. 77
6. Radial cross-vein present 7
   Radial cross-vein wanting 13
7. Front wings with medio-cubital cross-vein joined to vein Sc+R+M at or near origin of media, its distance from media always less than one-half the length of the cross-vein 8
   Front wings with medio-cubital cross-vein joined to vein Sc+R+M at a distance from origin of media, its distance

from media always one-half or more the length of the cross-vein 10

8. Front wings with medio-cubital cross-vein and M_{3+4} parallel BLENNOCAMPINÆ p. 142

Front wings with medio-cubital cross-vein and M_{3+4} strongly divergent behind 9

9. Hind wings with vein R_3 reaching the margin distinctly before apex of wing; cell R_{1+3} pointed at apex and closed SCOLIONEURINÆ p. 158

Hind wings with vein R_3 reaching the margin at or beyond apex of wing; cell R_{1+3} rounded at apex and open........ FENUSINÆ p. 156

10. Front wings with base of third anal vein present and second anal cell therefore not combined with third 11

Front wings with base of third anal vein atrophied and second and third anal cells therefore united .... DINEURINÆ p. 107

11. Front wings with medio-cubital cross-vein and vein M_{3+4} parallel or at least not divergent behind 12

Front wings with medio-cubital cross-vein and vein M_{3+4} strongly divergent behind ....HOPLOCAMPINÆ p. 105

12. Antennæ with eight or nine segments, rarely enlarged at apex; front wings with first abscissa of M subequal to abscissa of R; radio-medial cross-vein rarely if ever wanting ....................................TENTHREDININÆ p. 80

Antennæ with less than eight segments, always enlarged at apex into a club; front wings with first abscissa of M twice as long as abscissa of R; radio-medial cross-vein always wanting ....CIMBICINÆ p. 102

13. Front wings with third and combined first and second anal veins anastomosed at middle for a short distance, length of anastomosis always being less than length of second anal cell 14

Front wings with third and combined first and second anal veins anastomosed at middle for a considerable distance, anastomosis being two or three times the length of second anal cell, or with second anal cell wanting or combined with third anal cell, or with both first and second anal cells wanting 15

14. Antennæ never with more than nine segments; hind wings with vein R_3 reaching the margin before apex of wing; cell R_{1+3} pointed at apex and closed ....CLADIINÆ p. 108

Antennæ always with more than nine segments; hind wings with vein R_3 reaching the margin at apex of wing; cell R_{1+3} broad at apex and open ....MONOCTENINÆ p. 108

15. Antennæ always with nine segments ....NEMATINÆ p. 111

Antennæ with three or six segments 16

16. Antennæ with six segments; front wings with three anal veins fused into a single vein .... ACORDULECERINÆ p. 165

Antennæ with three segments; front wings with three anal veins never fused into a single vein 17

17. Front wings with free part of Sc_1 present ...... HYLOTOMINÆ p. 160

Front wings with free part of Sc_1 wanting ..... SCHIZOCERINÆ p. 164

DIPRIONINÆ.

Diprion Schrank.

Lophyrus Latreille.

Antennæ multiarticulate, with fifteen or more segments, strongly serrate in the female and bipectinate in the male, the rays shorter toward the apex; larvæ infesting various species of conifers.

Key to Species.

1. Antennæ with sixteen segments, black; head, thorax, abdomen, and legs in great part luteous; wings hyaline. Females **fabricii**

Antennæ with more than sixteen segments.................. 2

2. Head and thorax for the most part pale. Females.......... 3

Head and thorax for the most part black. Males.......... 8

3. Femora black or dusky at base; antennæ with eighteen segments; antennæ and scutellum pale yellow; mesonotum with large black spots occupying the greater part of its surface; head and thorax sparsely covered with deep punctures .... **abdominalis**

Femora wholly pale.. 4

4. Tibiæ waxen white, at least at base; antennæ with seventeen segments 5

Tibiæ with no part waxen white; antennæ usually with more than seventeen segments 6

5. Antennæ luteous brown; tegulæ, collar, and pleuræ luteous brown; a line joining the ocelli, a stripe on each side lobe of the mesothorax, and the sutures of the metathorax, black; claws with a tooth near the middle......... **pinus-rigida**

Antennæ black, with basal half of third segment pale; tegulæ, collar, and pleuræ waxen white; sides of metathorax black; claws with the tooth distinctly nearer the apex than the middle .... **abbotti**

6. Lateral lobes of mesonotum pale.......................... 7

Lateral lobes of mesonotum and sutures metallic black; body yellowish brown; antennæ with eighteen segments, black, the third segment pale at base; claws with a short tooth near the tip .... **abietis**

7. Antennæ with twenty segments; color yellow-brown; antennæ blackish; metathorax, tergum, and a stripe down each side of the venter, black; edges of pronotum, pleuræ, outer edges of abdomen, and knees, waxen white............**lecontei**

Antennæ with seventeen segments; color ferruginous; antennæ blackish ferruginous; sutures of face, mesothorax, abdomen, most of metathorax, and part of third and fourth segments of tergum, blackish; pleuræ dark brown........**akhursti**

8. Collar and edge of tegulæ white; antennæ with eighteen segments; ventral part of body and legs yellow-brown; basal half of wings clouded ....**abbotti**

Collar and tegulæ black....................................... 9

9. Antennæ with fifteen segments; abdomen beneath and at base and basal half of legs, yellow-brown; legs below knees whitish ....**pinus-rigida**

Antennæ with more than fifteen segments................. 10

10. Antennæ with twenty-one segments; head and mesothorax black; tergum dark piceous; pleuræ and breast black; venter reddish brown, legs reddish yellow, darkest at base ....**abietis**

Antennæ with twenty-two or more segments ....**lecontei**

°**D. fabricii** (Leach). *Lophyrus fabricii* Leach. Larva feeds on pitch pine.

°**D. abdominalis** (Say) *Lophyrus abdominalis* Say.

D. pinus-rigida (Norton). *Lophryus pinus-rigida* Norton. Larva feeds on *Pinus rigida,* and this is probably the species observed at Tariffville a few years ago, where many of the small pitch pines were nearly defoliated (W. E. B.).

D. abbotti (Leach). *Lophyrus abbotti* Leach. Howard, Insect Book, Pl. xii, Fig. 3. Larva feeds on white pine and pitch pine. Middletown, 1911; Litchfield, 1916.

D. abietis (Harris). *Lophryus abietis* Harris. Larva feeds on black spruce, fir, pitch pine. Connecticut (E. N.).

D. lecontei (Fitch). *Lophryus lecontei* Fitch. Howard, Insect Book, Pl. xiv, Fig. 5. Larva feeds on white pine, pitch pine, *Pinus banksiana,* Scotch pine, and Austrian pine. Middletown (D. MacDonald); Hampton (A. B. Roberts); Stamford, 8 May, 1911 (R. T. Morris).

°**D. akhursti** (Norton). *Lophyrus akhursti* Norton.

EMPHYTINÆ.

Key to Genera.

1. Posterior metatarsus subequal in length or shorter than the four following segments 2
Posterior metatarsus distinctly longer than the four following segments 13
2. Front wings with second abscissa of Cu_1 never shorter than free part of M_4... 3
Front wings with second abscissa of Cu_1 always shorter than free part of M_4.................................... 8
3. Front wings with second abscissa of Cu_1 distinctly longer than free part of M_4; claws with a minute erect tooth at middle 4
Front wings with second abscissa of Cu_1 subequal in length to free part of M_4..................................... 5
4. Front wings with free part of 2d A oblique; hind wings with cell R_{1+3} without an appendage at apex .... **Hemitaxonus** p. 46
Front wings with free part of 2d A perpendicular; hind wings with cell R_{1+3} with an appendage at apex .... **Epitaxonus** p. 46
5. Hind wings with cell R_{1+3} always with a distinct appendage at apex; front wings with free part of 2d A oblique 6
Hind wings with cell R_{1+3} never with an appendage at apex; front wings with free part of 2d A perpendicular .... **Taxonus** p. 46
6. Claws bifurcate at apex .... **Monostegia** p. 47
Claws always with a tooth but never bifurcate at apex...... 7
7. Claws cleft, with inner lobe not more than one-half the length of outer lobe ....**Phrontosoma** p. 47
Claws with an erect tooth at middle .... **Empria** p. 48
8. Front wings with radio-medial cross-vein always present.... 9
Front wings with radio-medial cross-vein always wanting **Emphytus** p. 55
9. Hind wings either with free part of R_4, or transverse part of M_3, or with both present.................................. 11
Hind wings with both free part of R_4 and transverse part of M_3 wanting 10
10. Claws with a large erect tooth at middle....**Parataxonus** p. 57
Claws appendiculately toothed at base........**Polytaxonus** p. 58
11. Hind wings with both free part of R_4 and transverse part of M_3 present ....**Eriocampa** p. 58
Hind wings with free part of R_4 wanting.................. 12
12. Head and thorax strongly cribrately punctate .... **Pseudosiobla** p. 58
Head and thorax smooth, without punctures...**Monosoma** p. 59

13. **Front wings with medio-cubital cross-vein present.......... 14**
    Front wings with medio-cubital cross-vein wanting ....
    Macremphytus p. 59
14. **Antennæ with second segment elongate, about twice as long as broad ....Strongylogastroidea p. 61**
    Antennæ with second segment annular, not or hardly as long as broad ....Dimorphopteryx p. 64

Hemitaxonus Ashmead.

H. dubitatus (Norton). *Taxonus dubitatus* Norton.

Body black, with the following parts rufous: labrum, clypeus, tegulæ, collar broadly, lobes of mesonotum, sternum, pleuræ, legs except posterior tibiæ and tarsi of female, entire abdomen in female, and abdominal segments one, two, and three in male; antennæ with third and fourth segments subequal; median fovea deep and broad, frontal ridge unbroken, ocellar basin completely enclosed. Length 10 mm. Larva feeds on *Onoclea*.

Connecticut (E. N.); East Hartford, 9 August, 1904, New Haven, 27 July, 1904 (P. L. B.); Cheshire, 8 July, 1904, New Haven, 4 July, 1905, Thompson, 11 July, 1905 (H. L. V.); Branford, 3 July, 1905 (H. W. W.); Milldale, 21 May, 1906, New Haven, 19 July, 1905, 1 June, 1911 (B. H. W.); Torrington, 7 July, 1905 (W. E. B.)

Epitaxonus MacGillivray.

°**E. albidopictus** (Norton). *Taxonus albidopictus* Norton.

Body black, with the following parts rufous: pleuræ, sternum, a band on abdominal segments one to three, coxæ, femora except a ring on apex of posterior pair, and front and middle tibiæ except their basal fourth; with the following parts white: labrum, clypeus, collar, tegulæ, basal fourth of all the tibiæ, and basal half of posterior metatarsus; median fovea extending laterad to the eyes; frontal ridge unbroken, and ocellar basin completely enclosed. Length 8 mm. Larva feeds on *Onoclea sensibilis*.

Taxonus Hartig.

Key to Species.

1. **Abdomen entirely black; body black, with all the legs, except the posterior tarsi, rufous; posterior tarsi fuscous; antennæ with third segment distinctly longer than fourth; frontal**

ridge wanting, median fovea coinciding with ocellar basin and extending as a narrow groove to above the median ocellus; wings very slightly infuscated, veins and stigma brownish. Length 8 mm. ....**nigrisomus**

Abdomen black, transversely banded with rufous 2

2. Coxæ black; body black, with the following parts rufous: labrum, tegulæ, a band covering a part of the second and the third and fourth abdominal segments, and legs, except middle and posterior tarsi; third segment of antennæ longer than fourth; median fovea wanting; ocellar basin distinct, its walls not prominent. Length 8 mm. **innominatus**

Coxæ in part pale; body black, with the following parts rufous or white: labrum, tegulæ, collar (black in male), entire abdomen in female and a band on segments two to four in male, apices of coxæ, trochanters, femora at apex and base, and base of tibiæ; hind femora and tibiæ in male black; wings hyaline; each ocellus in a basin. Length 6 mm. .... **amicus**

***T. nigrisomus** Norton. Larva feeds on dock. Hartford (Nason); Branford, 15 July, 1905 (H. W. W.); Thompson, 11 July, 1905 (H. L. V.); Stonington, 10 August, 1906 (J. A. Hyslop).

°**T. innominatus** MacGillivray.

°**T. amicus** Norton.

Monostegia Costa.

M. martini MacGillivray.

Body black, with the following parts rufous: labrum, collar broadly, tegulæ, metathorax, abdomen, legs, and base of wings; second segment of antennæ as long as fourth and fifth together; frontal ridge wanting, and median fovea and ocellar basin united. Length 7 mm. .Larva feeds on *Œnothera.*

Hartford (W. E. B.).

Phrontosoma MacGillivray.

Key to Species.

1. Prothorax and mesonotum in great part rufous.............. 2

Prothorax and mesonotum black........................... 3

2. Antennal furrow below lateral ocelli broad and coarsely punctate; body black, with tegulæ, a fine line on the col-

lar, and all the legs beyond the apical third of femora, white; apex of posterior tibiæ and tarsi infuscated; frontal ridge wanting, and median fovea and ocellar basin continuous; third segment of antennæ as long as fourth and fifth together. Length 6 mm .... **atra**

Antennal furrow below lateral ocelli narrow, with sharp walls, and impunctate; body black, with tegulæ, a narrow margin to pronotum, front and middle legs beyond basal fourth of femora, and posterior legs beyond knees, white; second segment of antennæ about as long as first, third about equal to fourth and fifth together; frontal ridge wanting, median fovea and ocellar basins continuous. Length 8 mm. .... **nortoni**

3. Femora black except at apex; body black, with a rufous spot covering the collar and mesonotum; tegulæ and legs beyond the apical third of the femora, white; third segment of the antennæ as long as fourth and fifth together; frontal ridge distinct and unbroken, median fovea and ocellar basin therefore not continuous; median fovea as large as or larger than the ocellar basin and extending through the supraclypeal area; triangular depression behind median ocellus not extending to the antennal furrow. Length 7 mm. .... **daeckei**

Femora white; body black, with a rufous spot covering the greater part of prothorax and mesonotum; third segment of antennæ hardly as long as fourth and fifth together; frontal ridge distinct and unbroken; median fovea long and distinct; ocellar basin almost wanting; triangular depression behind median ocellus distinct and extending to the antennal furrow. Length 7 mm. .... **collaris**

°**P. atra** MacGillivray.

°**P. nortoni** MacGillivray.

°**P. daeckei** MacGillivray.

°**P. collaris** MacGillivray.

Empria LePeletier.

Key to Species.

1. Clypeus uniformly flat or convex.......................... 2

Clypeus with a median longitudinal ridge or carina, frequently minute 6

2. Antennal furrows broadly rounded depressions, continuous from the antennal fovea to the lateral ocelli; ocellar basin a broadly depressed area from near the antennæ to the median ocellus; median fovea a minute pit; ocellar and interocellar furrows wanting; clypeus broadly roundly emarginate; third segment of antennæ longer than fourth; saw-guides straight above and broadly rounded below to a blunt point at apex above; body black, with labrum, tegulæ, and legs, except a spot on the outer margin of coxæ, white. Length 7 mm. .... **cavata**

Antennal furrows linear, broadly interrupted on the middle of the front 3

3. Ocellar basin a distinct depression extending to median ocellus 4

Ocellar basin wanting, or at most indicated only adjacent to median ocellus; median fovea a rounded pit............ 5

4. Ocellar basin a linear depression, with a distinct median fovea at its ventral end; ocellar furrow indicated at middle; interocellar furrow distinct; clypeus moderately deeply, angularly emarginate, with a low broad projection at middle; third segment of antennæ slightly longer than fourth; saw-guides straight above, convex below, narrowly obliquely rounded at apex; body black, with clypeus, labrum, tegulæ, a line on the collar, coxæ at apex, trochanters more or less, front femora, middle and hind femora at apex, front tibiæ and tarsi, middle tibiæ at base and beneath, and their tarsi, and hind tibiæ at base, dirty white. Length 7 mm. .... **callosa**

Ocellar basin a broad depression with broadly sloping sides, with a deep, broad median fovea at its ventral end; ocellar and interocellar furrows distinct; clypeus slightly bi-emarginate at apex, practically truncate; third and fourth segments of antennæ subequal; saw-guides convex above, convex below, broadly convexly rounded to a blunt point at middle of apex; body black, with collar, tegulæ, base of wings, and legs, white. Length 6 mm. .... **cætrata**

5. Postocellar area and dorsal margin of head polished, region of ocellar furrow flattened; ocellar and interocellar furrows distinct; clypeus angularly emarginate, lobes broadly rounded; third segment of antennæ longer than fourth; ocellar basin represented by a depression in front of median ocellus; median fovea deep with flaring sides; saw-guides with upper and lower margins parallel and truncately rounded at apex; body black, with clypeus at sides, labrum, tegulæ, collar, wings at base, and legs beyond apices of coxæ, except the front and middle femora more or less beneath, hind femora in great part, and hind tibiæ at apex, white. Length 6 mm. .... **celsa**

Postocellar area and dorsal margin of head finely punctate; ocellar and interocellar furrows distinct; clypeus broadly, shallowly, angularly emarginate, the lobes broadly rounded; third and fourth segments of antennæ subequal; ocellar basin not indicated in front of median ocellus; median fovea large with flaring sides; saw-guides with their upper and lower margins converging, obliquely truncately rounded at apex; body black, with mandibles, clypeus, labrum, collar, tegulæ, base of wings, and legs, except infuscations on femora, hind tibiæ, and more or less of their tarsi, white. Length 7 mm. .... convexa

6. Ocellar basin extending to median ocellus.................. 7

Ocellar basin not extending to median ocellus, at most only indicated adjacent to median ocellus or median fovea.... 17

7. Clypeus black 8

Clypeus white 12

8. Ocellar basin dumb-bell-shaped, constricted to a mere line at middle, broad and pit-like adjacent to median ocellus; median fovea an elongate pit; antennal furrows interrupted on the middle of the front; ocellar and interocellar furrows distinct; clypeus emarginate with a distinct tooth at middle; third segment of antennæ longer than the fourth; saw-guides with upper margins straight, lower margins converging, and broadly obliquely rounded at apex; body black, with labrum, clypeus, collar, tegulæ, base of wings, and legs beyond apices of coxæ, white. Length 6 mm. .... callida

Ocellar basin not dumb-bell-shaped, of approximately the same width throughout................................ 9

9. Clypeus with a broad, convexly rounded median ridge, occupying almost one-third of the width of clypeus; antennal furrows interrupted on the middle of the front; median tooth of clypeus distinctly shorter than lateral lobes, lateral lobes broadly rounded; ocellar furrow linear, interocellar furrow broad and distinct; third segment of antennæ almost as long as fourth and fifth together; saw-guides convex above and below, slightly obliquely rounded at apex; body black, with collar, tegulæ, front and middle legs below knees, and hind tibiæ beneath, white. Length 6 mm. .... cava

Clypeus with a fine linear median carina; antennal furrows more or less distinct throughout........................ 10

10. Clypeus tridentate, median tooth as long as lateral angles, broadly, shallowly emarginate, lateral angles rounded, median ridge low, not reaching dorsal margin of clypeus; postocellar area uniformly convex; ocellar and interocellar furrows distinct; third segment of antennæ longer than fourth; saw-guides slightly convex above, broadly convexly rounded below and at apex to a blunt point above;

body black, with collar, tegulæ, legs beyond knees for the most part, and caudal margin of abdominal segments, white. Length, 6 mm. ....costata

Clypeus tridentate, median tooth not more than one-fourth the length of lateral lobes.............................. 11

11. Clypeus shallowly, angularly emarginate, almost truncate, with a small but distinct tooth, lobes angularly rounded; median fovea a rounded pit opposite dorsal margin of antennal fovea; front not strongly produced between antennæ; ocellar and interocellar furrows deep and distinct; third segment of antennæ slightly longer than fourth; saw-guides slightly concave above, convex below, broadly rounded to a blunt point at middle of apex; body black, with labrum, collar, tegulæ, front and middle legs below apex of femora, and basal third of hind tibiæ, white. Length 6 mm. ....calda

Clypeus distinctly, but shallowly, roundly emarginate with a minute tooth, lobes acute; median fovea a pit opposite the middle of antennal fovea; front strongly produced between antennæ; ocellar and interocellar furrows distinct; third and fourth segments of antennæ subequal; body black, with collar and tegulæ white; front and middle legs beyond the basal third of their femora, and hind legs beyond the apical fourth of their femora, yellowish infuscated. Length 6 mm. ....cata

12. Ocellar basin extending beyond median fovea to the middle of antennal fovea; supraclypeal area elevated; median fovea but little deeper than ocellar basin; front strongly produced between antennæ; ocellar furrow only faintly indicated; interocellar furrow distinct; clypeus deeply roundly emarginate, with a minute tooth at middle, and lobes angular; third segment of antennæ longer than fourth; saw-guides convex above, straight below, and broadly rounded at apex; body black, with clypeus, labrum, tegulæ, collar, and legs beyond coxæ, white. Length 7 mm. caprina

Ocellar basin not extending beyond median fovea to the middle of antennal fovea.............................. 13

13. Clypeus broadly, shallowly, roundly emarginate............ 14

Clypeus narrowly, deeply emarginate...................... 15

14. Ocellar basin narrow and linear, ending ventrally in a pit-like median fovea, but little if any wider than ocellar basin; clypeus with a low, broadly rounded tooth at middle, lobes rounded; ocellar and interocellar furrows distinct; third segment of antennæ longer than fourth; saw-guides gradually converging on upper and lower margins, and broadly roundly pointed at apex; body black, with margin of clypeus, labrum, line on collar, tegulæ, front and middle legs below coxæ, except infuscation on the middle of femora, hind trochanters, tip of hind femora, base of hind tibiæ, and base of their tarsi, white. Length 7.5 mm. .... **casta**

Ocellar basin rather broad, broader near the median fovea; median fovea a broad crater, much wider than the ocellar basin; clypeus with a low broad tooth at middle, lobes broadly rounded; ocellar furrow indicated, interocellar furrow broad and distinct; the third segment of antennæ distinctly longer than fourth; saw-guides convex above, straight and converging to the roundly truncated apex; body black, with clypeus, labrum, collar, tegulæ, trochanters, front legs below the middle of femora, middle and hind legs beyond knees, apex of hind tibiæ and hind tarsi, more or less infuscated, white. Length 7 mm. **celebrata**

15. Clypeus with a low, broadly rounded tooth at middle........ 16

Clypeus with a small, acutely pointed tooth; ocellar basin broad with sloping sides, ending ventrally in a large median fovea with broadly sloping sides; ocellar and interocellar furrows distinct; third segment of antennæ longer than fourth; saw-guides convex above and below, broadly convexly rounded at apex, extreme apex truncate for a very short distance; body black, with clypeus, labrum, collar, tegulæ, and legs below knees, white. Length 6 mm. **captiosa**

16. Supraclypeal area narrow and carinately elevated; clypeus angularly emarginate with broadly rounded lobes and with a broadly rounded median tooth; median fovea an elongate pit with flaring sides at the ventral end of ocellar basin; ocellar furrow indicated, interocellar furrow distinct; third segment of antennæ distinctly longer than fourth; saw-guides parallel above and below and truncately rounded at apex; body black, with clypeus, labrum, tegulæ, and collar narrowly white; legs more or less infuscated. Length 6 mm. ....**cæca**

Supraclypeal area rather broad and only convexly elevated; clypeus deeply, narrowly, angularly emarginate to near the middle of clypeus; lobes roundly pointed; clypeal tooth small but distinct; ocellar and interocellar furrows distinct; a depressed area in front of median ocellus; third segment of antennæ distinctly longer than fourth; saw-guides with upper and lower margins parallel and broadly truncately rounded at apex; body black, with clypeus, labrum, collar, tegulæ, front and middle legs beyond the apices of coxæ, bases of their femora, more or less infuscated; hind trochanters, tibiæ and tarsi, sometimes infuscated, white. Length 7 mm. ....**maculata**

17. Clypeus black, heavily punctate........................... 18

Clypeus white, smooth or finely punctate................. 22

18. Clypeus distinctly emarginate............................. 19

Clypeus truncate; antennal furrows adjacent to antennal fovea well marked; ocellar furrow linear, distinct; interocellar furrow broad and deep; third segment of antennæ distinctly longer than fourth; saw-guides convex above, convex below, broadly converging to a blunt point just above the middle of apex; body black, with front and middle legs below the middle of femora, and base of tibiæ, ringed with white. Length 7 mm. ....**cauduca**

19. Interocellar furrow extending each side of median ocellus, forming an inverted Y-shaped furrow................... 20

Interocellar furrow extending only to median ocellus, forming only the stem of the Y; median fovea a rounded scar; clypeus with median tooth almost as long as lateral lobes, all angular, appearing tridentate; ocellar and interocellar furrows linear, deep; third and fourth segments of antennæ subequal; saw-guides convex above and below and slightly obliquely rounded at apex, the lower angle more rounded than the upper; body black, with collar, tegulæ, front and middle femora beneath at apex, front tibiæ, middle tibiæ beneath, and a ring at the base of the hind tibiæ, white. Length 6 mm. ....**castigata**

20. Median fovea a rounded depression....................... 21

Median fovea a wedge-shaped depression; clypeus with tooth and lobes pointed; ocellar furrow faint; interocellar furrow distinct; postocellar area with a median furrow; antennæ with third and fourth segments subequal; body black, with collar, tegulæ, apical half of front and middle femora, their tibiæ, and knees of hind legs, all more or less infuscated, white. Length 6 mm. ....**casca**

21. Median fovea a minute pin-hole pit; front flat adjacent to the fovea; clypeus with a small median tooth and lateral lobes broadly rounded; ocellar and interocellar furrows deep and distinct; third segment of antennæ slightly longer than fourth; saw-guides straight above, and the lower margin and apex broadly obliquely rounded to a point at the apex above; body black, with collar and tegulæ white; legs beyond the middle of femora brownish infuscated. Length 6 mm. ....**ignota**

Median fovea a broad pit with flaring sides; clypeus with a fine, median carina, median tooth short, lateral lobes broadly angular; ocellar furrow linear, interocellar furrow broad; saw-guides convex above, and broadly convexly rounded below and at apex to a blunt point; body black, with a line on collar, apex of front and middle femora, their tibiæ, and basal third of hind tibiæ, white. Length 6 mm. .... **evecta**

22. Clypeus broadly, shallowly emarginate 23

Clypeus narrowly, deeply emarginate, with a small median tooth and carina, lobes broadly angular; median fovea of moderate size, with perpendicular sides, except in front, strongly flaring; a triangular-shaped pit in front of median ocellus; ocellar furrow fine, interocellar furrow broad; saw-guides straight above, straight below, and converging to apex, apex with angles broadly rounded and square at middle; body black, with clypeus, labrum, collar, tegulæ, and legs below knees, tibiæ and tarsi, more or less infuscated, white. Length 6 mm. .... **candidula**

23. Postocellar area longitudinally carinate at middle; clypeus broadly emarginate; ocellar furrow faint or wanting, interocellar furrow distinct; third segment of antennæ nearly as long as fourth and fifth together; saw-guides convex above and below, convexly and slightly obliquely truncately rounded at apex; body black, with clypeus, labrum, collar, tegulæ, front and middle legs below coxæ, femora more or less infuscated, hind trochanters, and a ring on the base of hind tibiæ, white. Length 6 mm. .... **canora**

Postocellar area flat, not carinate at middle 24

24. Clypeus angularly emarginate with lobes angular; median fovea a pin-hole pit; ocellar and interocellar furrows faint; third segment of antennæ longer than fourth; saw-guides convex above and oblique below, roundly truncated at apex; body black, with clypeus, labrum, collar, tegulæ, front and middle trochanters, and hind tibiæ and tarsi, white. Length 6 mm. .... **cauta**

Clypeus roundly emarginate with lobes broadly rounded at apex; median fovea a pin-hole pit; ocellar furrow faint, interocellar furrow distinct; third segment of antennæ slightly longer than fourth; saw-guides straight above, convex below, truncately rounded at apex; body black, with clypeus, labrum, collar, tegulæ, front and middle legs below coxæ, hind trochanters, and basal third of hind tibiæ, white. Length 7 mm. .... **cariosa**

°**E. cavata** MacGillivray.

°**E. callosa** MacGillivray.

°**E. cætrata** MacGillivray.

°**E. celsa** MacGillivray.

°**E. convexa** (MacGillivray).

°**E. callida** MacGillivray.

°**E. cava** MacGillivray.

***E. costata** MacGillivray. New Haven, 11 May, 1911 (B. H. W.).

E. calda MacGillivray. New Haven, 15 May, 1905 (B. H. W.).

°**E. cata** MacGillivray.

°**E. caprina** MacGillivray.

°**E. casta** MacGillivray.

°**E. celebrata** MacGillivray.

°**E. captiosa** MacGillivray.

°**E. caeca** MacGillivray.

E. maculata (Norton). *Harpiphorus maculatus* Norton. Larva feeds on strawberry. Connecticut (E. N.); Hartford, 12 May, 1894; Mt. Carmel, 24 May, 1906, Westville, 2 June, 1908, Yalesville, 26 May, 1908, New Haven, 22 May, 1908 (B. H. W.).

°**E. cauduca** MacGillivray.

°**E. castigata** MacGillivray.

E. casca MacGillivray. New Haven, 24 May, 1905 (W. E. B.).

E. ignota (Norton). *Monostegia ignota* Norton. Larva feeds on strawberry. Connecticut (E. N.).

E. evecta MacGillivray. New Haven, 24 May, 1905 (W. E. B.).

E. candidula MacGillivray. Waterbury, 9 June, 1905 (W. E. B.).

°**E. canora** MacGillivray.

°**E. cauta** MacGillivray.

E. cariosa MacGillivray. Hamden, 25 May, 1911 (B. H. W.).

Emphytus Klug.

Key to Species.

1. Head with the antennal furrow at most only faintly indicated; collar white 2

Head with a distinct antennal furrow extending from the clypeus to the occiput; collar black 3

2. Abdomen with venter white or rufous; body black, with the following parts white: clypeus, labrum, collar, tegulæ, a spot on pleuræ, last dorsal abdominal segment, and legs except the posterior tarsi; tergum of abdomen black, with a median broad triangular rufous spot on each segment, the spots frequently united, forming an irregular band; antennæ with third and fourth segments subequal; median fovea an elongate, shallow groove; ocellar basin wanting. Length 7 mm. ....**apertus**

Abdomen with venter black; body black, with the following parts white: fine line on collar, tegulæ sometimes, an interrogation-shaped point on pleuræ (sometimes wanting), and legs, except middle and posterior tarsi in female and posterior tibiæ and tarsi in male; antennæ with third segment longer than fourth; median fovea a broadly expanding pit just above supraclypeal area; ocellar basin wanting. Length 8 mm. ....**inornatus**

3. Femora wholly rufous; body black, with the following parts white: labrum usually, tegulæ, apices of coxæ, trochanters, and fourth abdominal segment in female for the greater part; legs, except the parts named, rufous; antennæ with third and fourth segments subequal; ocellar basin an elongate depressed area extending from anterior ocellus to supraclypeal area, angular above, broadly roundly expanded along the sides, and pointed below, with median fovea at its apex; ocellar furrow distinct, connected with ocellar basin, indicated by a minute notch; saw-guides with upper margins straight and lower margins broadly convexly rounded to a point at apex. Length 8-10 mm. ....**mellipes**

Femora of anterior and middle legs at least in great part black 4

4. Femora all in great part black; body black, with the following parts white: tegulæ, costa at base, posterior trochanters, anterior and middle femora at apex in front, basal fourth of tibiæ, and fourth abdominal segment in female; legs, with coxæ and anterior and middle trochanters black, all the other parts not named, rufous; antennæ with third segment longer than fourth, and fourth and fifth subequal; median fovea a broad pit just above supraclypeal area; ocellar basin an ovate depressed area separated from the median fovea by a distinct transverse ridge and extending for some distance behind the lateral ocelli as a fine groove; ocellar furrow wanting; saw-guides convex above and broadly convexly rounded below, and extending to a bluntly rounded point at apex above. Length 8 mm. .....
cinctipes

Femora all in great part black except the posterior pair; body black, with the following parts white: tegulæ, trochanters, femora at apex in front, anterior tibiæ and tarsi, knees of the middle and posterior tibiæ, a spot on the middle of basal plates, and an interrupted band on fourth abdominal segment; legs, with coxæ black, all other parts not named, rufous; antennæ with third, fourth, and fifth segments subequal; ocellar basin a broad shallow depression extending from above anterior ocellus to supraclypeal area and not interrupted at middle; median fovea a rounded pit in lower part of ocellar basin; interocellar furrow a fine furrow connecting ocellar basin and ocellar furrow; saw-guides with upper and lower margins straight, obliquely truncate, and roundly pointed at apex. Length 7-9 mm. .... **gillettii**

***E. apertus** Norton. Connecticut (E. N.); Putnam, 12 July 1905 (H. L. V.); Thompson (A. P. Morse).

E. inornatus Say. Connecticut (E. N.); Putnam, 12 July, 1905, Hartford, 20 May, 1904 (H. L. V.); New Haven, 19 July, 1905 (B. H. W.); Wallingford, 7 June, 1910 (W. E. B.).

***E. mellipes** Norton. Howard, Insect Book, Pl. xiv, Fig. 3. Connecticut (E. N.); New Haven, 24 May, 1905 (W. E. B.), 4 July, 1905 (H. L. V.).

E. cinctipes Norton. Howard, Insect Book, Pl. xiv, Fig. 8. Larva feeds upon rose. Connecticut (E. N.).

E. gillettii MacGillivray. Larva feeds on strawberry.

Parataxonus MacGillivray.

P. multicolor (Norton). *Taxonus multicolor* Norton.

Black, with the following parts yellowish white: clypeus, labrum, a spot in front and between the bases of antennæ, posterior and inner orbits, tegulæ, collar, an oblique band or spot on pleuræ, and legs; abdomen with a row of elongate, ovate, reddish yellow spots on each side of meson, in some individuals becoming so prominent as to cover the entire abdomen except a trapezoidal or triangular black spot on the middle of each segment; median fovea and ocellar basin continuous. Length 7-8 mm. Larva feeds on white and yellow birch.

Hamden, 14 June, 1911 (B. H. W.); New Haven, 26 May, 1911 (A. B. C.).

Polytaxonus MacGillivray.

°**P. robustus** (Provancher). *Taxonus robustus* Provancher.

Black, with the following parts white: labrum, mandibles, collar, tegulæ, apices of coxæ, costa, and apical two-thirds of stigma; with the following parts rufous: legs, except coxæ, tarsi, and apex of posterior tibiæ, and a band covering abdominal segments two to five; median fovea large, distinct, extending nearly to median ocellus, ocellar basin not depressed; third segment of antennæ very slightly longer than fourth. Length 8 mm.

Eriocampa Hartig.

***E. rotunda** (Norton). *Sciapteryx rotundus* Norton.

Black, with legs, except coxæ and apices of middle and posterior femora and posterior tibiæ and tarsi, yellowish; head and thorax strongly punctate; frontal area prominent; third segment of antennæ almost as long as fourth and fifth together; wings hyaline with an indistinct fascia beneath stigma.

Farmington (E. N.).

Pseudosiobla Ashmead.

°**P. excavata** (Norton). *Siobla excavata* Norton.

Tegulæ black; body black, with the following parts yellow: first, second, and base of third segment of antennæ, collar, a quadrangular spot on pronotum below tegulæ, cenchri, basal plates, trochanters, front femora except a dusky spot at base, their tibiæ and tarsi, middle legs beyond the middle of femora, a ring at the base of the posterior femora, basal two-thirds of tibiæ, and the greater part of the metatarsus; first abdominal segment yellowish; wings slightly infuscated. Length 10 mm. Larva feeds on button-bush.

°**P. robusta** (Kirby). *Siobla robusta* Kirby.

Tegulæ rufous; body black, with the following parts rufous or yellowish rufous: the first, second, and base of third segment of antennæ, metathorax, basal plates, first abdominal segment, legs in part, except where marked with black as in preceding species, and costa and stigma; labrum, collar, area on pronotum below tegulæ, and tibiæ yellow; wings strongly infuscated. Length 13 mm.

Monosoma MacGillivray.

***M. inferentia** (Norton). *Pœcilostoma inferentia* Norton.

Female rufous, with the following parts black: head except clypeus and labrum, antennæ, metathorax and saw-guides; with the following parts white: labrum, tegulæ, collar, and a fine line on the apex of each abdominal segment; third segment of antennæ as long as fourth and fifth together; median fovea and ocellar basin continuous. Male differs in having head, thorax, and abdomen black, and legs dark rufo-fuscous. Length 8 mm. Larva feeds on alder.

Farmington (E. N.).

Macremphytus MacGillivray.

Key to Species.

1. Antennæ either black or rufous at base and white at apex, or entirely black 2

Antennæ with four basal segments rufous and five apical segments black; body in female rufous, with the following parts white: labrum, apices of coxæ, trochanters, a band at the base of tibiæ, metatarsi in part, and basal half of stigma; with the following parts black: five apical segments of antennæ, antennal furrow and ocellar basin, lateral portion in part and ventral portion of prothorax, lateral lobes of mesonotum, metathorax in part, coxæ, basal half of anterior and middle femora, the posterior femora, and the apex of posterior tibiæ; antennæ with third segment longer than fourth, fourth and fifth subequal; head with the ridges forming the side of ocellar basin parallel, and with the area between lateral ocelli distinctly depressed; postocellar area without a furrow; saw-guides straight above and gradually sloping toward the apex where they are obliquely rounded to a point above. Male differs in having the greater part of head and thorax black and the greater part of legs beyond coxæ white or rufous. Length, 8-10 mm. .... **semicornis**

2. Antennal furrow not as deep opposite the anterior ocellus as elsewhere, and with a supernumerary furrow extending obliquely from the antennal furrow toward the eye 3

Antennal furrow of the same depth throughout and without an oblique supernumerary furrow 4

3. Thorax in great part black with rufous markings; head with the raised area between lateral ocelli flat and broken at center by a line-like furrow; ocellar furrow distinct; ocel-

lar basin shallow, not well defined except near anterior ocellus, where the raised ridges are marked by a flat angular ridge extending back of anterior ocellus, forming the apex of a triangle; antennæ with third and fourth segments subequal, fifth shorter; saw-guides narrow, gradually sloping to the apex above and convexly below to a rounded point; body rufous, with the following parts white: antennal segments six to nine, labrum, tegulæ, basal half of stigma, trochanters, and tarsi; with the following parts black: antennal segments three to five, vertex and front in great part, clypeus, thorax except scutellum, basal plates, coxæ, and apical half of posterior femora. Length 10 mm. **versicolor**

Thorax in great part rufous with black markings; head with the raised area between lateral ocelli flat and broken at center by a line-like furrow; ocellar furrow distinct; ocellar basin shallow, but with distinct walls, especially heavy near anterior ocellus, and only faintly marked by the shelf extending around anterior ocellus; antennæ with third segment slightly longer than fourth and fourth slightly longer than fifth; saw-guides broad, slightly sloping above, the lower margin sloping and rounded abruptly, obliquely truncated at apex; body rufous, with the following parts white: antennal segments six to nine, labrum, tegulæ, apices of coxæ, trochanters, and tarsi; with the following parts black: antennal segments four and five, postocellar area, prothorax except collar, lateral lobes of mesonotum, pectus broadly, coxæ, apex of middle and posterior tibiæ, and apex of saw-guides. Length 14 mm. ....**testaceus**

4. Body color in general rufous; area between posterior ocelli divided by a deep, angular furrow; ocellar furrow wanting or indistinct; ocellar basin deep with heavy walls, walls converging at middle, constricting the ocellar basin, furrow extending around the anterior ocellus with rounded sides and somewhat indistinct; antennæ with segments broad and flat, third and fourth subequal and very slightly longer than fifth; saw-guides with the upper and lower margins slightly converging, obliquely truncated at apex, and bluntly rounded to a point above; body with the following parts white: antennal segments six to nine, labrum, tegulæ, scutellum, trochanters, base of posterior femora, and tarsi; with the following parts black: antennal segments four and five, postocellar area, thorax except the parts named and median lobe of mesonotum, bases of the anterior and middle femora, apical half of the posterior femora, and apex of posterior tibiæ. Length 10-15 mm. ....**varianus**

Body color in general black; area between posterior ocelli divided by a deep angular furrow; ocellar furrow distinct; ocellar basin deep with heavy walls and almost straight, the furrow extending around anterior ocellus with the sides angular and sharply defined; antennæ with segments broad, segments three to five subequal in length; saw-guides with the upper margin straight and the lower margin convexly sloping to a point at apex above; body black, with the following parts white: antennal segments six to nine, labrum, trochanters, anterior and middle tibiæ, base of posterior tibiæ, and tarsi. Length 14-16 mm. ....**tarsatus**

M. semicornis (Say). Connecticut (E. N.).

°**M. versicolor** (Norton). Larva feeds on *Cornus*.

°**M. testaceus** Norton.

***M. varianus** (Norton). Howard, Insect Book, Pl. xiii, Fig. 10. Larva feeds on *Cornus*. Farmington (E .N.).

M. tarsatus (Say). Howard, Insect Book, Pl. xiii, Fig. 6. Larva feeds on *Cornus*. Connecticut (E. N.).

Strongylogastroidea Ashmead.

Key to Species.

1. Antennæ in part pale.. 2
   Antennæ entirely black.. 9
2. Antennæ pale at apex and frequently also at base.......... 3
   Antennæ pale at base only.................................. 8
3. Head in great part pale.................................... 4
   Head in great part black.................................... 7
4. Posterior femora black; antennæ black at base; body black, with the following parts white: clypeus, labrum, four apical segments of antennæ, tegulæ, a very narrow line on collar, posterior coxæ in great part, trochanters, and scutellum; with the following parts rufous: head with the exception of ocellar and postocellar areas and lower half of antennal furrow, prothorax at sides, median lobe of mesonotum, an irregular spot on mesopleuræ, abdomen except saw-guides, front and middle legs beyond middle of femora, and posterior tibiæ and tarsi; anterior ocellus situated in front of a distinct angular diverging ridge; saw-guides with the upper margin straight, the lower margin semi-straight, rounded, and obliquely truncate and pointed at apex. Length 11 mm. **spiculata**
   Posterior femora rufous, at most only with a ring at apex; antennæ usually rufous at base.......................... 5

5. Mesonotum with median lobe rufous........................ 6

Mesonotum with median lobe black; body in female rufous, with the following parts white: clypeus, labrum, antennal segments six to nine, a narrow line on collar, the V-spot of the mesonotum, a spot beneath anterior wings, scutellum, postscutellum; coxæ and trochanters white, shading to rufous; with the following parts black: postocellar area, an irregular spot at base of clypeus, ventral part of prothorax, mesothorax except parts named and a large spot on pleuræ, and metathorax; saw-guides with their upper and lower margins subparallel, slightly convex, and rounded, squarely truncate at apex. Male has basal segments of antennæ rufous above and pleuræ almost entirely rufous. Length 11 mm. ....**mellosa**

6. Female with saw-guides concave above, convex below, and the apex almost squarely truncate; body rufous with the following parts white: narrow line on collar, scutellum, postscutellum, apices of coxæ, and trochanters; with the following parts black: spot surrounding ocelli, a small spot on the middle of postocellar area, lateral lobes of mesonotum, prothorax in great part, pectus, and bases of coxæ ....**confusa**

Female with saw-guides straight or slightly convex above, convex below, and gradually rounded to a blunt point at apex; body rufous, with the following parts white: clypeus, labrum, antennal segments six to nine, usually a fine line on collar, scutellum, and postscutellum; with the following parts black: antennal segments four to six, postocellar area sometimes, lateral lobes of mesonotum, metathorax, ventral part of prothorax, pectus, coxæ, trochanters in part, saw-guides, and a ring on the apex of posterior femora; amount of black extremely variable, in some specimens entire head, metathorax, prothorax, and entire legs rufous with black lines on sutures. Length 11mm. ....**terminalis**

7. Eyes in great part margined with white; body in female black, with the following parts white: clypeus, labrum, antennal segments six to nine, outer orbits, inner orbits, genæ, supraclypeal area, posterior margin of head, tegulæ, collar, V-spot, a spot beneath each wing, a line or spot on pleuræ, scutellum and postscutellum, coxæ at side, and trochanters; the following parts rufous: abdomen including basal plates, and legs beyond trochanters; third segment of antennæ longer than fourth; saw-guides with the upper and lower margins parallel and broadly truncately rounded at apex. Male differs only in having the white more pronounced on center of thorax. Length 11 mm. ....**pallidicornis**

Eyes never margined with white; body in female black, with the following parts white: antennal segments six to nine, clypeus, labrum, a fine line sometimes on collar, scutellum and postscutellum, apices of coxæ, and trochanters; with the following parts rufous: tegulæ, wings at base, abdomen including basal plates, and legs beyond trochanters except a ring on the apex of posterior femora; third segment of antennæ longer than fourth; saw-guides with the upper margin straight, lower margin convex, and squarely truncated at apex; normal individuals have head entirely black, except as specified above, but many specimens have more or less rufous on the head, and in some individuals head is almost entirely rufous. Male differs only in having apex of abdomen washed with black. Length 9-11 mm.....**apicalis**

8. Pleuræ entirely black; body in female black, with the following parts rufous: clypeus, labrum, three or four basal segments of antennæ, collar, tegulæ, basal portion of wings, legs beyond apices of trochanters, and abdomen beyond basal plates; third segment of antennæ longer than fourth; saw-guides convex above and below and obliquely rounded to a point at apex above. Male differs in having labrum, clypeus, collar, tegulæ, and bases of legs whitish, and apex of the abdomen infuscated with black. Length 9 mm...**epicera**

Pleuræ entirely rufous; body black, with the following parts white: clypeus, labrum, antennal segments one and two, tegulæ, scutellum, costa, coxæ, and trochanters; with the following parts rufous: prothorax, mesopleuræ, metapleuræ in part, abdomen, and legs beyond trochanters except a ring on the apex of posterior femora; third segment of antennæ as long as fourth and fifth together; saw-guides straight above, convex below, and obliquely roundly truncated at apex. Length 9 mm. ....**pallipes**

9. Coxæ entirely white.. 10

Coxæ entirely black except sometimes at apex; antennæ with second segment distinctly longer than broad; body black, with the following parts rufous: labrum, tegulæ, base of wings, legs beyond coxæ except posterior tarsi, and abdominal segments two to five; third segment of antennæ longer than fourth; mesopleuræ densely, finely punctate; saw-guides with the upper and lower margins parallel and roundly truncated at apex. Length 10 mm. ....**rufocincta**

10. Scutellum black; body black, with the following parts white: clypeus, labrum, a fine line on collar, tegulæ, coxæ, trochanters, costa, and base of stigma; with the following parts rufous: legs beyond trochanters except a ring on the apex of posterior femora and posterior tarsi, and abdominal segments two, three, and four; third segment of antennæ

longer than fourth; saw-guides with the upper and lower margins parallel and obliquely rounded to a point at the apex above. Length 8 mm. .... **unicincta**

Scutellum white; body black, with the following parts white: clypeus, labrum, collar in great part, postscutellum, coxæ, and trochanters; with the following parts rufous: legs beyond trochanters, and abdomen beyond basal plates except saw-guides; third segment of antennæ nearly as long as fourth and fifth together; saw-guides with the upper and lower margins parallel and obliquely truncated at apex. Length 9 mm. .... **proxima**

°**S. spiculata** MacGillivray.

S. mellosa (Norton). *Strongylogaster mellosus* Norton. Connecticut (E. N.); New Haven, 1 June, 1911, 30 May, 1911, Lyme, 20 Aug., 1910 (B. H. W.).

°**S. confusa** MacGillivray.

S. terminalis (Say). Howard, Insect Book, Pl. xiv, Fig. 30. Connecticut (E. N.); New Haven, (A. E. V.); New Haven, 17 June, 1911.

°**S. pallidicornis** (Norton).

S. apicalis (Say). Howard, Insect Book, Pl. xii, Fig. 11. Larva feeds on *Rubus*. Connecticut (E. N.); Farmington (H. L. V.); Westville, 2 June, 1908; New Haven (A. E. V.); 3 June, 1908 (B. H. W.); Middlebury, 26 May, 1911 (W. E. B.).

S. epicera (Say). Connecticut (E. N.).

°**S. pallipes** (Say).

***S. rufocincta** (Norton). Howard, Insect Book, Pl. xiv, Fig. 26. Connecticut (E. N.); Torrington, 7 July, 1905, Prospect, 15 August, 1906 (W. E. B.); New Haven, 26 May, 1904 (H. L. V.), 12 July, 1905 (B. H. W.).

***S. unicincta** (Norton). *Taxonus unicinctus* Norton. Farmington (E. N.).

°**S. proxima** (Provancher). *Strongylogaster proximus* Provancher.

Dimorphopteryx Ashmead.

***D. pinguis** (Norton). *Strongylogaster pinguis* Norton.

Body in female black, with the following parts rufous: clypeus, labrum sometimes, tegulæ, scutellum and postscutellum (sometimes white), legs beyond apices of coxæ except a ring on apices of posterior femora and tibiæ, and abdominal segments one to four, with sometimes a spot on the disk of fifth; antennæ varying from yellow to rufous and black; third segment almost twice as long as fourth; segments beyond third distinctly serrate; head and thorax deeply, closely punctate; saw-guides with upper and lower margins parallel and obliquely roundly truncated at apex. Male differs in having scutellum and postscutellum black and entire abdomen beyond basal plates rufous or infuscated and almost entirely black. Length 9-11 mm. Larva feeds on birch, basswood, *Amelanchier,* and maple.

Connecticut (E. N.). A larva feeding upon sweet cherry at New Haven was identified as this species by Dyar. The same species was received from Harwinton, 16 August, 1902. New Britain, 4 August, 1906 (W. E. B.).

SELANDRIINÆ

Key to Genera.

1. Front wings with first abscissa of Cu_1 distinctly longer than free part of M_4; costa dilated at apex.................... 2
   Front wings with first abscissa of Cu_1 subequal in length to free part of M_4; costa not dilated at apex.................. 4
2. Claws simple, without a tooth at base; front wings with media strongly angularly bent at base ....**Selandria** p. 66
   Claws with a minute erect tooth at base; front wings with media not strongly angularly bent at base................ 3
3. First anal cell of hind wings closed at wing margin and therefore distinctly longer than the cell in front of it; front wings with media coalescing with radial sector for a short distance .... **Polyselandria** p. 66
   First anal cell of hind wings distinctly petiolate and therefore shorter than the cell in front of it; front wings with media separating from radius distinctly before origin of radial sector ....**Pseudoselandria** p. 66
4. Claws strongly appendiculately dentate ....**Stromboceros**
   Claws not appendiculately dentate.......................... 5
5. Claws with a minute erect tooth at base ....**Thrinax** p. 67
   Claws strongly bifurcate at apex .... **Strongylogaster** p. 67

Selandria Leach.

***S. flavipes** Norton.

Black, with tegulæ, collar, and legs beyond the apices of coxæ yellowish-white; third segment of antennæ longer than fourth; ocellar basin and median fovea distinct and not connected; tergum of abdomen sometimes reddish; wings yellowish hyaline. Length 5-7 mm. Larva feeds on *Pteris aquilina.*

Connecticut (E. N.); New Haven, 27 July, 1904 (P. L. B.), 4 July, 1905 (H. L. V.), 31 July, 1910 (B. H. W.); Branford, 28 July, 1905, Thompson, 11 July 1905 (H. L. V.); Orange, 21 May, 1911 (A. B. C.).

Polyselandria MacGillivray.

°**P. decolorata** (Cresson).

Pleuræ wholly shining black; body black, with tegulæ, collar, labrum, and legs beyond apices of the coxæ yellowish white; third segment of the antennæ a little longer than the fourth; wings usually strongly infuscated on the basal two-thirds; ocellar basin and median fovea distinct; tergum of the abdomen usually rufous, sometimes entirely black. Length 5-7 mm.

°**P. floridana** (MacGillivray).

Pleuræ shining black with a large, round, yellowish white spot at middle; body black, with clypeus, labrum, tegulæ, collar, and legs beyond the coxæ yellowish white; posterior tarsi infuscated at apex; third segment of the antennæ very slightly longer than the fourth; wings strongly infuscated. Length 5 mm.

Pseudoselandria MacGillivray.

°**P. oxalata** MacGillivray.

Black, with the following parts whitish: two basal segments of the antennæ, the labrum, the clypeus, the collar broadly, the tegulæ, the upper half or more of the pleuræ, the legs, the wings at base, and the abdomen except the saw-guides; median fovea deep, ovate, transverse; ocellar basin distinct; third segment of the antennæ as long as the fourth and fifth together; wings hyaline, with the apex of the radius strongly dilated and black. Length 7 mm.

Thrinax Konow.

T. impressatus (Provancher). *Strongylogaster impressatus* Provancher.

Black, with the following parts rufous; the tegulæ, a triangular spot on the collar, the legs beyond the apices of the coxæ, the costa, and the basal third of the stigma, the disk of abdominal segments two, three, and four, wholly or in part, or with the apical half of the first and all of the three following segments; median fovea large, transverse, ovate; ocellar basin indistinct except adjacent to the anterior ocellus. Length 7-10 mm.

New Haven (B. H. W.).

Strongylogaster Dahlbom.

Key to Species.

1. Antennæ dark rufous, with the basal segments red; body black, with the following parts rufous: upper half of orbits, middle of the pleuræ, abdomen, and legs in part; with following parts yellow: spot between and beneath the antennæ, lower half of the orbits, labrum, clypeus, collar, scutellum, and a spot at the base of coxæ; wings infuscated at middle. Length 10 mm. .... **rufescens**

Antennæ entirely black.................................... 2

2. Thorax except collar and tegulæ rufous, abdomen rufous in female and black in male; remainder of body black; third and fourth segments of antennæ subequal; median fovea and ocellar basin wanting; head densely punctate; wings strongly infuscated. Length 8 mm. ....**unicus**

Thorax either entirely black, or black with collar and tegulæ pale 3

3. Abdomen entirely pale beyond first segment................ 4

Abdomen entirely or in part black beyond first segment..... 5

4. Tegulæ and collar black; body and legs black, with abdomen and anterior tibiæ rufous; wings strongly infuscated; third and fourth segments of antennæ subequal; median fovea indistinct; ocellar basin narrow, trough-like; head deeply, sparsely punctate. Length 7-8 mm. ....**tacitus**

Tegulæ and large spot on collar yellow; body black, with abdomen beyond first segment and legs brownish; wings hyaline, costa and stigma in great part brownish; third and fourth segments of antennæ subequal; head finely, sparsely punctate. Length 9 mm. ....**longulus**

5. Abdomen with basal half of each segment straw-yellow and apical half black; wings hyaline, stigma and costa pale; antennæ with third segment longer than fourth; head

coarsely punctate; legs black, with tips of femora, tibiæ, and tarsi pale reddish. Length 9 mm. .... **multicinctus**

Abdomen never with basal half of each segment pale and apical half black 6

6. Abdomen with basal half of segments black and apical half whitish; antennæ with third and fourth segments subequal; head rough, and densely finely punctate; body black, with tegulæ, a broad spot on collar, and legs beyond apices of femora, except apices of tarsi, yellowish white; wings hyaline, costa and apex of stigma pale; median fovea and ocellar basin fairly distinct. Length 10-11 mm. .... **annulosus**

Abdomen either entirely black, or abdominal segments with a narrow pale line; antennæ with third and fourth segments subequal; head very finely punctate; body black, with tegulæ, collar, labrum, anterior and middle tibiæ and tarsi, and basal half of posterior tarsi, yellowish white; coxæ, trochanters, and femur rufous, remainder of legs black; median fovea and ocellar basin distinct. Length 10 mm. ..**politus**

°S. **rufescens** Norton.

°S. **unicus** Norton.

S. **tacitus** Say. Connecticut (E. N.); Cheshire, 8 July, 1904, Thompson, 11 July, 1904 (H. L. V.); New Haven, 9 June, 1905, 31 July, 1910 (B. H. W.), 28 July, 1911 (A. B. C.).; Hamden, 25 May, 1911, Lyme, 29 May, 1910 (A. B. C.).

°S. **longulus** Norton.

°S. **multicinctus** Norton.

°S. **annulosus** Norton. Larva feeds on *Pteris aquilina*.

°S. **politus** Provancher.

DOLERINAE.

Key to Genera.

Genæ broad, their width as great as the length of first segment of antennæ, eyes therefore distant from base of mandibles; eyes round or short oval in outline, inner margin always convex .... **Dolerus** p. 69

Genæ narrow, their width distinctly less than the length of first segment of antennæ, eyes therefore adjacent to base of mandibles; eyes elongate and emarginate on their inner margin .... **Loderus** p. 76

Dolerus Jurine.

Key to Species.

1. Surface of apex of scutellum entirely smooth............... 2
Surface of apex of scutellum wholly or in part punctate or striate 14
2. Mesouotum with median lobe either finely punctate or almost impunctate at middle, and with large, coarse punctures or rugosities at sides..................................... 3
Mesonotum with median lobe uniformly punctate at middle and at sides, at least never with a band of large punctures on each side 11
3. Pectus with three longitudinal rows of punctures that are distinctly larger than the adjacent punctures.............. 4
Pectus not with three rows of larger punctures; if any of the punctures are larger than others, then not arranged in rows 10
4. Vertical furrow with its lateral margin continued as an elevated area to upper corner of eye....................... 5
Vertical furrow with its lateral margin not extended as an elevated area below lateral ocelli......................... 7
5. Head with a distinct carina between posterior orbits and occiput; postocellar area and upper orbits uniformly punctate; median lobe of mesonotum more densely punctate than lateral lobes; lateral lobes and the scutellum uniformly punctate; body dull black; wings fuliginous. Length 10-12 mm. ....**sericeus**
Head not with a distinct carina between posterior orbits and occiput; postocellar area with fewer, smaller punctures than upper orbits................................. 6
6. Scutellum and inflexed and dorsal portions of lateral lobes of mesonotum with the punctuation similar in size and arrangement; vertical furrows distinct and sharply cut, with an impunctate area on the posterior orbits; median lobe of mesonotum more densely punctate than lateral lobes; body dull black; wings infuscated, especially around the margins. Length 10 mm. ....**parasericeus**
Scutellum and inflexed portion of mesonotum with punctuation larger and distinctly denser than on dorsal surface; vertical furrows distant and sharply cut, with an impunctate area on upper orbits; median lobe of mesonotum distinctly more densely punctate than lateral lobes; body dull black; wings fuliginous. Length 12 mm. ....**neosericeus**
7. Punctures on scutellum more sparse and twice as large as those of lateral lobes of mesonotum; vertical furrows deep with sloping sides; postocellar area more finely punctate than posterior orbits; head with a carina between occi-

put and posterior orbits; body dull black; wings infuscated. Length 11 mm. ....**polysericeus**

Punctures on scutellum similar in size and arrangement to those of lateral lobes of mesonotum 8

8. Vertical furrows obsolete; mesonotum with impunctate area on lateral surface of lateral lobes extending to median lobes; postocellar area more closely punctate than posterior orbits; posterior orbits not with a ridge extending from antennal furrow to eye; median lobe of mesonotum and scutellum more deeply and distinctly punctate than lateral lobes; wings fuliginous, veins and stigma black; body black. Length 10 mm. ....**tectus**

Vertical furrows deep and distinct....................... 9

9. Mesonotum with the impunctate area on lateral surface of lateral lobes not extending to median lobe; postocellar area and posterior orbits uniformly punctate; posterior orbits with a fine ridge extending from posterior end of antennal furrow to eye; median lobe of mesonotum finely, densely punctate; body uniformly black; wings fuliginous. Length 14 mm. ....**colosericeus**

Mesonotum with impunctate area on lateral surface of lateral lobes extending to median lobe; the postocellar area more finely punctate than posterior orbits; posterior orbits not with a fine ridge extending from antennal furrow to eye; median lobe of mesonotum finely, densely punctate; body uniformly black; wings fuliginous. Length 10 mm. **monosericeus**

10. Vertical furrows continued as broad distinct furrows to near middle of eyes; mesonotum with impunctate area on lateral surface of lateral lobes not extending to median lobe; postocellar area with many fine punctures, and posterior orbits with adjacent large punctures, subrugose; body entirely black, except abdominal segments one to five which are rufous; wings infuscated on apical half. Length 12 mm. ....**apriloides**

Vertical furrows not continued below lateral ocelli; mesonotum with the impunctate area of lateral surface of lateral lobes extending to median lobe; postocellar area and posterior orbits finely punctate, postocellar area more densely; body black, with abdominal segments one to five rufous; wings hyaline, smoky toward the apex. Length 11 mm. ....**neoaprilis**

11. Head with a distinct carina between occiput and posterior orbits 12

Head not with a distinct carina between occiput and posterior orbits 13

12. Mesonotum with median lobe densely punctate and lateral lobes almost smooth; postocellar area densely, finely punctate, and posterior orbits almost smooth; vertical furrows sharp and distinctly cut; body black, with collar, tegulæ, abdominal segments one to five, and legs beyond the middle of coxæ, rufous; wings slightly infuscated. Length 8 mm. .... **minusculus**

Mesonotum with median lobe not more densely punctate than lateral lobes; postocellar area and posterior orbits uniformly punctate; body black, with pronotum in front irregularly, abdominal segments one to four, segment five at base, apical half of front coxæ, front femora and tibiæ, middle femora and tibiæ, except a black spot above at apex, and knees in part, rufous; tegulæ white; wings hyaline. Length 8 mm. .... **luctatus**

13. Mesonotum with the impunctate area of lateral surface of lateral lobes not extending to median lobe; vertical furrows linear, definite, sharply cut, three times as long as broad; head with a transverse furrow extending between eyes and behind ocelli; head uniformly punctate; body black, with pronotum entirely, median lobe of mesonotum, and upper half of mesoepimeron, rufous; wings slightly infuscated. Length 10 mm. .... **neocollaris**

Mesonotum with the impunctate area of lateral surface of lateral lobes extending distinctly to median lobe; vertical furrows punctiform, indefinite, as broad as long; head uniformly, finely punctate; body rufous, with head, antennæ, lateral lobes of mesonotum, scutellum at middle, pectus, saw-guides, stigma on its outer half, legs, except knees of front pair, black; wings infuscated at middle. Length 9 mm. .... **icterus**

14. Surface of apex of scutellum wholly or in part punctate...... 15

Surface of apex of scutellum wholly or in part striate...... 16

15. Surface of apex of scutellum uniformly finely punctate; vertical furrows distinct; postocellar area and posterior orbits uniformly, closely punctate; lateral lobes of mesonotum more finely and densely punctate than the median lobe or scutellum; body black, with pronotum, median lobe of mesonotum, and upper half of pleuræ rufous; wings subhyaline, clouded at apex. Length 12 mm. .... **refugus**

Surface of apex of scutellum longitudinally striate at middle and punctate at sides; vertical furrows narrow, line-like, distinct; postocellar area more finely and densely punctate than posterior orbits; median lobe of mesonotum and scutellum finely densely punctate, lateral lobes smooth with distant punctures; body black, with abdominal segments one to five rufous; wings yellowish, veins black. Length 9 mm. .... **inspectus**

16. Surface of apex of scutellum not striate over its entire surface 17

Surface of apex of scutellum striate over its entire surface.... 19

17. Mesonotum with the median lobe with a row of punctures on each side that are four or five times as large as the adjacent punctures; postocellar area and posterior orbits uniformly punctate; sides of antennal furrow behind ocelli continued as a ridge to eyes; body black, with a narrow margin on pronotum, abdominal segments one to four and the basal half of fifth segment, trochanters in part, femora, except a black spot at apex above, and knees, rufous; wings hyaline. Length 8 mm. .... **apricus**

Mesonotum with median lobe not with a row of large punctures on each side.................................... 18

18. Antennal furrow an elongate, punctiform indentation not extending below lateral ocelli; postocellar area and posterior orbits uniformly punctate; mesonotum and scutellum moderately, densely, finely punctate; body rufous, with head, antennæ, lateral lobes of mesonotum, metanotum, scutellum except at sides, postscutellum, pectus, legs, and saw-guides black; wings fuliginous with clearer lines. Length 11 mm. .... **bicolor**

Antennal furrow extending as a narrow, depressed line from occiput below lateral ocelli; postocellar area and posterior orbits with punctures of the same size but closer together on postocellar area; lateral lobes of mesonotum not so densely punctate as median lobe or scutellum; body black, with abdominal segments one to four, and tibiæ, at least on their basal half, rufous. Length 7 mm. .... **cohæsus**

19. Surface of apex of scutellum longitudinally striate............ 20

Surface of apex of scutellum transversely striate............ 24

20. Head viewed from above with a deep transverse furrow, broadly rounded at bottom, extending from vertical furrow to beyond hind angle of eye....................... 21

Head viewed from above not with a deep transverse furrow extending from vertical furrow to eye, sometimes indicated for a part of the distance.............................. 23

21. Vertical furrows punctiform or wanting; postocellar area more densely punctate than posterior orbits or region adjacent to vertical furrows; vertex with a small impunctate area adjacent to vertical furrows; scutellum more densely punctate than lobes of mesonotum; body black, with prothorax, tegulæ, median lobe of mesonotum, and abdominal segments one to six, rufous. Length 9 mm. .... **inspiratus**

Vertical furrows linear and distinct........................ 22

22. Head with postocellar area more densely punctate than sides of vertex; body black, with median lobe of mesonotum sometimes knees, and abdominal segments one to five, rufous; wings hyaline, veins black, stigma paler below. Length 8 mm. .... **conjugatus**

Head with the postocellar area and sides of the vertex uniformly, finely punctate; body black, with abdominal segments one to five and basal half of sixth, rufous; wings hyaline, veins and stigma black. Length 10 mm..... **dysporus**

23. Mesonotum with impunctate area on sides of lateral lobes not extending to margin of median lobe; head with a fine ridge extending from eye obliquely toward occiput; median lobe of mesonotum more densely punctate than lateral lobes; body black, with the prothorax, tegulæ, and abdominal segments one to five, rufous; wings very slightly infuscated, veins and stigma black. Length 8 mm. ...... **plesius**

Mesonotum with impunctate area on sides of lateral lobes extending broadly to margin of median lobe; head not with a fine ridge extending from eye toward occiput; mesonotum finely, densely punctate; body black, with prothorax, tegulæ, median lobe of mesonotum, upper half of pleuræ, and abdomen except saw-guides, rufous; wings infuscated, veins black. Length 9 mm. .... **agcistus**

24. Mesonotum with impunctate area on sides of lateral lobes distinct and extending broadly to median lobe.......... 25

Mesonotum with impunctate area on sides of lateral lobes almost entirely wanting, or, at least always separated from median lobe by a narrow punctate area 26

25. Antennal furrows subobsolete above base of antennæ or with minute lateral foveæ; body in female blue, with pronotum, tegulæ, lobes of mesonotum, except a blue spot on middle of median lobe, rufous; wings uniformly infuscated, veins black; male differs in having body wholly blue. Length 10 mm. .. .. **unicolor**

Antennal furrows extending as deep linear furrows above base of antennæ to near middle of face; body in female dull black, with pronotum, lobes of mesonotum, and usually upper anterior corner of pleuræ, rufous; wings uniformly infuscated; male differs in having body entirely dull black. Length 10 mm. .... **collaris**

26. Head when viewed from above with a transverse furrow extending behind eyes and ocelli........................... 27

Head when viewed from above with a transverse furrow extending across head behind eyes, interrupted by an oblique ridge extending from postocellar area to upper posterior corner of eye; lateral lobes of mesonotum not so densely punctate on the disk as at sides; body black, with prothorax for the most part, a spot on each side of median lobe of mesonotum, tegulæ, knees, and abdominal segments one to five, rufous; wings yellowish hyaline, paler at base. Length 10 mm........................**stugnus**

27. Head with a carina behind the eyes between the occiput and posterior orbits 28

Head not with a carina behind the eyes between the occiput and posterior orbits 29

28. Head with postocellar area more densely punctate than sides of vertex; median third of lateral lobes of mesonotum more densely punctate than its disk; body black, with labrum, prothorax, median lobe of mesonotum, front legs beyond middle of femora, tegulæ, and abdominal segments one to six and sometimes part of seventh, rufous; wings hyaline or very slightly infuscated. Length 9 mm..............**similis**

Head with postocellar area and sides of vertex uniformly densely punctate; median third of lateral lobes of mesonotum not more densely punctate than its disk; body black, with abdominal segments one to five and usually a part of six, rufous; wings hyaline or very slightly infuscated. Length 9 mm. ....**aprilis**

29. Vertex adjacent to postocellar area with a small impunctate area; postocellar area as densely punctate as the front; median lobe of mesonotum not so densely punctate as lateral lobes; body black, with prothorax, tegulæ, median lobe of mesonotum except at middle, and abdominal segments one to five, rufous; wings hyaline, veins black, stigma rufous below. Length 7 mm. ....**acritus**

Vertex without an impunctate area adjacent to postocellar area 30

30. Median lobe of mesonotum finely, densely punctate, lateral lobes not so closely, but deeply punctate; body dull black, with abdomen wholly rufous; third segment of antennæ but little longer than fourth; wings infuscated, veins black, stigma black, paler on hind margin. Length 8 mm. .**abdominalis**

Median lobe of mesonotum with large, distant punctures, lateral lobes with distant shallow punctures, appearing almost smooth; scutellum more closely and finely punctate than lobes of mesonotum; front densely, compactly punctate, posterior orbits coarsely punctate, not so densely adjacent to the postocellar area as distant from it; postocellar area coarsely punctate, more densely than the portion of the posterior orbits adjacent to it; body black, with prothorax, tegulæ, a spot on each side of median lobe of mesonotum, lateral lobes of mesonotum, upper half of pleuræ, basal plates, and abdomen except the saw-guides, rufous. Length 11 mm. ....**versus**

D. sericeus Say. Howard, Insect Book, Pl. xiii, Fig. 27. Connecticut (E. N.); Stonington, 26 April, 1907 (W. E. B.).

°**D. parasericeus** MacGillivray.

°**D. neosericeus** MacGillivray.

°**D. polysericeus** MacGillivray.

***D. tectus** MacGillivray. New Haven, 4 May, 1904 (H. L. V.).

D. colosericeus MacGillivray. New Haven, 4 May, 1904 (H. L. V.).

D. monosericeus MacGillivray. New Haven, 4 May, 1904 (H. L. V.).

°**D. apriloides** MacGillivray.

°**D. neoaprilis** MacGillivray.

°**D. minusculus** MacGillivray.

°**D. luctatus** MacGillivray.

°**D. neocollaris** MacGillivray.

°**D. icterus** MacGillivray.

D. refugus MacGillivray. New Haven, 4 May, 1904 (H. L. V.).

°**D. inspectus** MacGillivray.

D. apricus (Norton). Connecticut (E. N.); Salisbury, 30 August, 1904, Torrington, 7 July, 1905 (W. E. B.).

D. bicolor Beauvois. Connecticut (E. N.); New Haven, 4 May, 1904 (H. L. V.); Lyme, 2 April, 1910, 14 May, 1911, Orange, 21 May, 1911 (A. B. C.).

°**D. cohæsus** MacGillivray.

***D. inspiratus** MacGillivray. Hamden, 14 July, 1911 (B. H. W.); New Haven, 30 May, 30 July, 1911 (A. B. C.).

D. conjugatus MacGillivray. Thompson, 11 July, 1905 (H. L. V.); New Haven, 15 May, 1911 (A. B. C.).

D. dysporus MacGillivray. New Haven, 19 April, 1910 (B. H. W.).

°**D. plesius** MacGillivray.

°**D. agcistus** MacGillivray.

D. unicolor Beauvois. Female, *D. arvensis* Say. Howard, Insect Book, Pl. xii, Fig. 10. Connecticut (E. N.); New Haven, 4, 7 May, 1904 (H. L. V.), 2 May, 1905 (B. H. W.); Westville, 22 April, 1905, 16, 25 April, 5 May, 1906, Stonington, 26 April, 17 May, 1907 (W. E. B.); Branford, 11 May, 1906 (H. W. W.); Westport, 12 April, 1905 (W. E. B.); Manchester, 1 May, 1911 (B. H. W.); Lyme, 2 April, 1910 (A. B. C.); Warehouse Point, 21 April, 1910 (W. E. B.).

D. collaris Say. Connecticut (E. N.); Lyme, 2 April, 1910 (A. B. C.).

°**D. stugnus** MacGillivray.

***D. similis** Norton. Howard, Insect Book, Pl. xiv, Fig. 31. Connecticut (E. N.).

***D. aprilis** (Norton). Howard, Insect Book, Pl. xii, Fig. 17. Connecticut (E. N.): New Haven, 4, 7 May, 1904 (H. L. V.), 15, 17 May, 9 June, 12 July, 1905, 19 April, 1910 (B. H. W.). Occurs throughout the state.

°**D. acritus** MacGillivray.

***D. abdominalis** (Norton). Connecticut (E. N.); New Haven, 4 May, 1904 (H. L. V.).

D. versus Norton. New Haven (A. E. V.).

Loderus Konow.

***L. albifrons** (Norton). *Dolerus albifrons* Norton. Howard, Insect Book, Pl. xiii, Fig. 20.

Surface of the apex of the scutellum very finely striate at base, smooth at apex; head very finely, densely, uniformly punctate, the lower half covered with a dense, white, sericeous pile; lobes of mesonotum uniformly finely punctate; body black, with the supraclypeal area, the clypeus, the labrum, the inner orbits enlarged into a wedge-shaped dilation near the middle of the eye, and the tegulæ, white; front and middle legs beyond the trochanters, the tarsi (sometimes infuscated), the posterior trochanters, the posterior femora except a ring at apex, and abdominal segments one to four and a part of the fifth, rufous; wings hyaline or slightly infuscated. Length, 8 mm.

Connecticut (E. N.); Milldale, 21 May, 1906 (B. H. W.).

PHYLLOTOMINÆ.

Key to Genera.

Antennæ with second segment about one-half as long as first and about as long as broad; clypeus truncate .... **Endelomyia** p. 77

Antennæ with second segment subequal in length with first and always much longer than broad; clypeus emarginate. **Caliroa** p. 77

Endelomyia Ashmead.

E. æthiops (Fabricius). *Eriocampoides æthiops* Fabricius. *Monostegia rosæ* Harris. Rose Sawfly.

Body black, with the front and middle legs below the knees, and the knees of the hind legs, white; a distinct V-shaped furrow behind the median ocellus, connecting with an indistinct furrow in front of the postocellar area; pentagonal area entirely wanting; lateral foveæ minute; saw-guides straight above, broadly convexly rounded from base to a point at apex above. Larva feeds on various species of *Rosa*. Length 5 mm.

Connecticut (E. N.); Branford, 12 May, 1905 (H. W. W.); New Haven, 24 May, 1908 (B. H. W.).

Caliroa Costa.

Key to Species.

1. Clypeus roundly emarginate.................................. 2
Clypeus angularly emarginate.................................. 8

2. Front wings with radial cross-vein and free part of R_4 interstitial or nearly so; body black, with front and middle legs below knees white; walls of pentagonal area distinct, a V-shaped furrow behind median ocellus, lateral walls of pentagonal area continued to bases of antennæ where they are enlarged and separated by a distinctly and deeply impressed triangular median fovea; saw-guides long and slender, straight above and below, oblique and bluntly rounded at apex; wings more or less infuscated on basal half. Length 6 mm. ....**cerasi**
Front wings with radial cross-vein and free part of R_4 distant 3

3. Front distinctly impressed around the median ocellus; V-shaped furrow always more or less indicated 4
Front uniformly flat around the median ocellus, without any indication of a V-shaped furrow.......................... 6

4. Supraclypeal area convexly elevated throughout its entire length 5

Supraclypeal area flat, somewhat elevated adjacent to the median fovea; body black, with front and middle legs below knees, basal half of posterior tibiæ, and metatarsi, white; pentagonal area rounded in outline behind, walls low and fading out before; median fovea shaped like an impressed tetrahedron with all its margins broadly rounded; saw-guides retracted, convex below and bluntly rounded to a blunt point; wings infuscated on basal half. Length 6 mm. **lorata**

5. Postocellar area distinctly broader than long and not strongly convex; body black, with front and middle legs below knees, hind legs with knees, basal half of tibiæ, and tarsi more or less, white; pentagonal area angular in outline behind median ocellus, with distinct walls, gradually fading out in front; median fovea shaped like an impressed tetrahedron, the outer margin being rounded; saw-guides convex above and below, gradually rounded to a point at the apex; wings hyaline. Length 4.5 mm. .... **lunata**

Postocellar area about as long as broad and strongly convex; body black, with front and middle legs below knees, basal two-thirds of hind tibiæ, and basal three-fourths of hind metatarsi, white or luteous; pentagonal area angular behind median ocellus, deep and distinctly impressed, walls slanting; median fovea deep and strongly impressed, sides parallel, gradually shelving off above; front with deep, round, pit-like lateral foveæ not joining the antennal foveæ; saw-guides straight above, broadly convexly rounded below to a blunt point at apex above. Length 4-6 mm. .... **quercus-alba**

6. Front with sides of pentagonal area extending ridge-like to bases of antennæ, never mound-like.................... 7

Front with sides of pentagonal area expanded above bases of antennæ into mound-like elevations; body black, with front and middle legs below knees, hind tibiæ on basal half, and their tarsi in part, white; pentagonal area with all its walls perfectly flat; clypeus deeply emarginate; saw-guides retracted, pointed at apex; wings hyaline. Length 5.5 mm. .... **lobata**

7. Frontal crest strongly elevated above general level of basin above it; walls of pentagonal area distinct, strongly expanded below into a pair of elevated parenthesis-shaped ridges; body black, with legs below knees, except apical half of posterior tibiæ, white; antennæ with third segment subequal in length to fourth and fifth together; saw-guides with sides parallel, slender, and bluntly rounded at apex; wings infuscated on the basal half. Length 6 mm. .... **obsoleta**

Frontal crest not elevated above general level of the basin above it; walls of pentagonal area distinct, but broadly rounded, broadly expanded at their ventral ends, parenthesis-shaped, the curve being turned outward, forming a frontal crest not strongly raised above the surface adjacent to it, deeply broken at the middle; body black, with legs below middle of the femora white, more or less fuscous in places; third segment of antennæ not as long as fourth and fifth together; wings infuscated. Length 4 mm............ **quercus-coccinea**

8. Supraclypeal area broadly convex, not with an elevated ridge at the middle; body black, with front and middle legs beyond knees fuscous white; pentagonal area indefinite, the V-shaped area indicated, lateral ridges continued to bases of antennæ; median fovea triangular in outline, with rounded walls; antennæ with third segment as long as fourth and fifth together; saw-guides straight on upper and lower margins, obliquely truncated and with a blunt point at the apex above; wings more or less infuscated. Length 5.5 mm. ....**fasciata**

Supraclypeal area elevated at the middle into a prominent carina; body black, with legs beyond knees white; pentagonal area well defined, with a distinct V-shaped furrow behind the median ocellus; median fovea indefinite, transverse; third segment of antennæ not as long as fourth and fifth together; saw-guides straight above, slightly convexly rounded, somewhat truncated at apex above; wings hyaline. Length 4.5 mm. ....**lata**

C. cerasi (Linnæus). *Eriocampoides limacina* Retzius. *Selandria cerasi* Peck. *Eriocampa cerasi* Peck. Pear Slug. Larva is reported as feeding on *Pyrus, Prunus, Rubus, Amygdalus, Cratægus, Betula,* and *Quercus.* Connecticut (E. N.); New Haven, 20 June, 1905 (H. L. V.).

°**C. lorata** MacGillivray.

°**C. lunata** MacGillivray.

***C. quercus-alba** (Norton). *Selandria quercus-alba* Norton. *Monostegia quercus-alba* Norton. Larva feeds on white oak. Farmington (E. N.).

°**C. lobata** MacGillivray.

***C. obsoleta** (Norton). *Selandria obsoleta* Norton. Larva feeds on wild cherry. Poquonock, New Haven (H. L. V.); Branford, 20 May, 1905 (H. W. W.).

°**C. quercus-coccinea** (Dyar). *Monostegia quercus-coccinea* Dyar. Larva feeds on the leaves of the scarlet oak, *Quercus coccinea.*

***C. fasciata** (Norton). *Selandria fasciata* Norton. *Eriocampa fasciata* Norton. Larva feeds on oak. New Haven, 26 June, 1905 (H. L. V.).

°**C. lata** MacGillivray.

TENTHREDININÆ.

Key to Genera.

1. Head broad between the eyes, broader at the antennæ than the eyes are long; inner margins of the eyes subparallel... 2
Head narrow between the eyes, narrower at the antennæ than the length of the eyes; eyes strongly convergent below.... 8
2. Antennal sockets with their mesal margins not dilated.... 3
Antennal sockets with their mesal margins distinctly dilated 4
3. Anal veins anastomosed for a considerable distance, free part of 2d A wanting ....**Pachyprotasis** p. 81
Anal veins not anastomosed; free part of 2d A present. **Lagium** p. 81
4. Basal plates divided at the middle by a longitudinal suture... 6
Basal plates not divided at the middle...................... 5
5. Malar space distinctly shorter than width of the posterior orbits; hind wings with either free part of R_4 or M_3 or both present ....**Tenthredopsis** p. 82
Malar space subequal in length to width of posterior orbits; hind wings with both the free part of R_4 and M_3 wanting. **Neopus** p. 82
6. Clypeus truncate ....**Bivena** p. 82
Clypeus distinctly emarginate.............................. 7
7. Lateral ocelli above a line drawn between the posterior corners of the eyes; hind wings with free part of R_4 and transverse part of M_3 wanting .... **Leucopelmonus** p. 83
Lateral ocelli below a line drawn between the posterior corners of the eyes; hind wings with free part of R_4 and transverse part of M_3 present .... **Rhogogastera** p. 83
8. Antennal sockets with their mesal margins not dilated, or, if dilated, only slightly so and then not with the area between them deeply hollowed out.................. 9
Antennal sockets with their mesal margins strongly dilated and with the area between them deeply hollowed out; antennæ never thickened toward apex .... **Tenthredo** p. 83
9. Antennæ with nine segments............................ 10
Antennæ with eight segments ....**Labidia** p. 92

10. Hind coxæ elongated so that apex of hind femora reaches to or beyond apex of abdomen; middle coxæ much smaller than hind coxæ, reaching to or slightly beyond proximal end of hind coxæ .... **Macrophya** p. 92

Hind coxæ not elongated, apex of hind femora not reaching to apex of abdomen; middle coxæ subequal in size to hind coxæ, reaching to and usually beyond middle of hind coxæ ....**Allantus** p. 101

Pachyprotasis Hartig.

P. rapæ (Linnæus). *Pachyprotasis omega* Norton. *Synairema americana* Provancher.

Female: body black, with clypeus, labrum, mandibles, postgenæ, inner and posterior orbits, antennæ at base beneath, V-shaped spot on mesonotun, tegulæ, scutellum, postscutellum, pluræ, spot at base of hind wings, coxæ, trochanters, front and middle femora and tibiæ and tarsi beneath, basal half of posterior femora, posterior tibiæ beneath, and lateral margin of abdomen, white. Male differs in having the white more extended. Length 6-7 mm.

Connecticut (E. N.).

Lagium Konow.

Key to Species.

1. Head above lateral ocelli impunctate, strongly punctate below; median femoral pocket smooth, polished, impunctate; body black, with apices of front femora and their tibiæ and tarsi beneath yellowish; second and third abdominal segments above rufous; wings strongly infuscated. Length 13 mm. ....**cinctulum**

Head above and below lateral ocelli strongly punctate; median femoral pocket finely longitudinally rugose 2

2. Abdomen wholly black; body black, with apex of anterior femora, their tibiæ and tarsi beneath, yellow; a spot on the posterior coxæ white, sometimes wanting in males; wings strongly infuscated. Length 13 mm. ....**atroviolaceum**

Abdomen wholly rufous beyond the basal plates, except the saw-guides ....**atroviolaceum** var. **tardum**

L. cinctulum (Norton). *Tenthredo atroviolacea* var. *cinctula* Norton. New Haven, 13 July, 1904 (P. L. B.); Scotland, 25 July, 1904 (B. H. W.); Lyme, 5 August, 1911 (A. B. C.).

L. atroviolaceum (Norton). *Tenthredo atroviolacea* Norton. *Tenthredopsis atroviolacea* Norton. -

Connecticut (E. N.).

L. atroviolaceum var. tardum (Norton). *Tenthredo atroviolacea* var. *tarda* Norton. Connecticut (E. N.); Hartford (Nason).

Tenthredopsis Costa.

***T. semilutea** (Norton). *Tenthredo semilutea* Norton.

Female: body black, with the clypeus, labrum, mandibles, supraclypeal area, line on collar, tegulæ, lateral margin of pronotum, broad spot on mesopleuræ, line on metapleuræ, pectus for the most part, small spot of lateral lobes of mesonotum, scutellum, the coxæ, and the trochanters, white; abdomen beyond the basal plates, antennæ either entirely beyond the second segment or beneath beyond the second segment, and the remainder of the legs except a black ring on the apex of posterior femora, rufous. Male differs in having a line on the front and middle legs extending to the apex of femora and on the posterior legs extending to the apex of the tibiæ, with the disk of the basal plates, the two basal abdominal segments, and a minute spot around the abdominal spiracles, black. Length 7-8 mm.

Connecticut (E. N.).

Neopus MacGillivray.

°**N. 14-punctatus** (Norton). *Tenthredo 14-punctata* Norton. *Tenthredopsis 14-punctata* Norton.

Body greenish white, with a spot on the vertex, the disk of each lobe of the mesonotum, the disk of the pronotum, the sutures of the thorax, the legs more or less above, the tarsi darkest, and the sutures of the abdomen, black; sometimes the metathorax entirely, a line between the prothoracic pleuræ and pectus, and a triangular spot on the disk of the abdominal segments, black. Length 9 mm.

Bivena MacGillivray.

°**B. delta** (Provancher). *Pachyprotasis delta* Provancher. *Tenthredopsis delta* Provancher. *Homœoneura delta* Provancher.

Female: body black, with the clypeus, labrum, mandibles, supraclypeal area, genæ, inner orbits, collar narrowly, tegulæ, spot on mesopleuræ, scutellum, spot above posterior coxæ, coxæ for the most part, and trochanters, white; antennæ beneath, legs beyond trochanters, except the posterior femora and tibiæ at apex, and abdominal segments two to four, rufous. Male differs in having more black on the posterior legs. Length 6-8 mm.

Leucopelmonus MacGillivray.

°**L. annulatus** MacGillivray.

Female: body black, with the labrum, antennal segments five and six, the tegulæ, the apices of the coxæ, the trochanters, the middle and posterior tarsi, and the stigma at base, white; antennæ at base, the clypeus, mandibles, spot on supraclypeal area, prothorax, mesonotum except spots on lateral lobes, scutellum, postscutellum, legs beyond the trochanters except parts named, mesopleuræ and metapleuræ in great part sometimes, and abdomen, rufous. Male differs in having the entire antennæ and only abdominal segments one to five rufous, the posterior femora and tibiæ black at apex. Length 7-10 mm.

Rhogogastera Konow.

°**R. evansii** (Harrington). *Tenthredopsis evansii* Harrington.

Body greenish-yellow, with the antennæ above, a spot on the vertex, the greater part of the mesonotum, the metanotum, the apex of the scutellum, a broad band along the middle of the tergum, the apices of the tibiæ, and the apex of each tarsal segment, black; wings hyaline; the head smooth, impunctate. Length 12 mm.

Tenthredo Linnæus.

Key to Species.

1.	Antennæ wholly or in part pale..........................	2
	Antennæ wholly black..........................	20
2.	Antennæ wholly pale..........................	3
	Antennæ in part black..........................	8
3.	Abdomen wholly black beyond basal plates..............	4
	Abdomen wholly or in part rufous..........................	6
4.	Femora rufous	48
	Femora for the most part black	5
5.	Head uniformly finely punctate; body black, with clypeus, labrum, mandibles at base, scutellum, legs beyond coxæ except posterior femora, and basal plates in part, yellow; antennæ, posterior orbits, tegulæ, wings in great part, and anterior and middle femora, somewhat rufous. Length 11 mm. ......fernaldi	
	Head impunctate, but finely, indefinitely wrinkled; body black, with antennæ, clypeus in part, front femora before,	

front and middle tibiæ and tarsi before, tarsal segments ringed with black at apex, yellowish fuscous; sides of basal plates yellow; wings slightly infuscated, the veins and stigma fuscous. Length 12 mm. ....**dubitata**

6. Ocellar basin with a ridge at middle; abdomen wholly rufous; body rufous, with some small spots on head, antennæ in part sometimes, prothorax in great part, side lobes of mesonotum in part, mesopleuræ in part, pectus, and abdominal segments in part, black; clypeus, labrum, mandibles at base, a spot on supraclypeal area, inner orbits, beneath eyes, collar, tegulæ, and a spot above the coxæ and on the sides of the basal plates, yellow. Length 11 mm. .....**mellina**

Ocellar basin with a furrow at middle; abdomen not wholly rufous 7

7. Abdomen black at base and rufous at apex; body rufous, with antennal area in part, prothorax in great part, lobes of mesonotum in part, pectus, and three basal segments of abdomen, black; clypeus, labrum, mandibles, spot above posterior coxæ, sides of basal plates, and tarsi and posterior tibiæ in great part, yellow. Length 12 mm. ....**redimacula**

Abdomen black at base and apex, rufous at middle; body black, with clypeus, labrum, mandibles at base, spot on supraclypeal area, collar, scutellum, a spot above posterior coxæ, sides of basal plates, and tarsi, yellow; tegulæ, front femora beneath, tibiæ for the most part, and abdominal segments two to four, rufous. Length 10 mm. ....**neoslossoni**

8. Antennæ pale at base or apex............................ 9

Antennæ pale beneath, black above........................ 18

9. Antennæ pale at apex.................................... 10

Antennæ pale at base..................................... 14

10. Abdomen beyond the basal plates wholly black 11

Abdomen wholly or in part pale........................ 13

11. Ocellar basin deeply hollowed out, scoop-shaped, and impunctate; body black, with clypeus, labrum, mandibles at base, antennæ at apex, a spot above posterior coxæ, and sides of basal plates, yellow; front and middle femora in part, tibiæ, and tarsi beneath, rufous; scutellum and mesonotum densely, finely punctate. Length 12 mm. ......**nigricollis**

Ocellar basin hollowed out with a transverse ridge above the middle 12

12. Anterior femoral pocket yellow; body black, with clypeus, labrum, mandibles at base, antennæ at apex, collar broadly, anterior femoral pocket, scutellum, spot above posterior coxæ, apex of basal plates, front legs beneath beyond the middle of the femora, and middle legs beneath beyond the apex of the femora, yellow; wings infuscated at apex. Length 12-13 mm. ....**grandis**

Anterior femoral pocket black; body black, with clypeus, labrum, mandibles at base, antennæ at apex, collar, scutellum, front legs beneath beyond the middle of the femora, middle tarsi, a spot on sides of basal plates, apex of basal plates, sometimes broadly, rarely a spot above posterior coxæ, white; wings infuscated at apex. Length 12 mm. ....**antennata**

13. Abdomen black at base and apex, rufous in middle; body black, with apex of antennæ, a white spot above posterior coxæ, a spot on pleuræ, sides of basal plates, anterior and middle coxæ and trochanters in part, tegulæ, base of costa, legs except the parts named and the bases of the coxæ, a line on the femora above, a spot at apex of the tibiæ above, posterior tarsi for the greater part, and abdominal segments three to six, rufous. Length 10 mm. ....**semicornis**

Abdomen yellow; body black, with clypeus, labrum, mandibles at base, cheeks, orbits, two spots on postocellar area, apex of antennæ, collar and tegulæ, scutellum, two spots on pleuræ, and apices of coxæ, a spot on side of posterior coxæ, and trochanters, yellow; legs, except apex of posterior femora, rufous. Length 11 mm. ....**jocosa**

14. Vertex impunctate, polished.............................. 15

Vertex finely, distinctly punctate.......................... 17

15. Head with orbits wholly black; body black, with clypeus, labrum, mandibles at base, cheeks broadly, collar, tegulæ, oblique spot at middle and edge of posterior margin of mesopleuræ, spot above posterior coxæ, coxæ except above, and margin and sides of basal plate, white; legs (except a line above on front and middle femora, hind coxæ, apex of femora above, apex of tibiæ and tarsi), and abdomen, rufous; in some specimens the antennæ may be entirely black or rufous beneath at the apex, or the apex of the abdomen black, or the pleuræ almost wholly black. Length 13 mm. ....**signata**

Head with orbits in great part yellow................... 16

16. Appendage of scutellum transversely striate, with numerous large punctures; body black, with clypeus, labrum, mandibles at base, cheeks, orbits, interrupted opposite base of antennæ and at top of head, collar, tegulæ, vittæ on mesonotum, metanotum in part, spot above posterior coxæ, and spot on side of basal plates, yellow; legs beyond coxæ, except basal half of middle and hind femora above, two basal segments of antennæ, and abdomen beyond third segment, rufous. Length 13 mm. ....**bilineata**

Appendage of scutellum not striate, with few punctures or none; body in female black, with clypeus, labrum, mandibles, supraclypeal area, orbits in great part, collar, tegulæ, vittæ on mesonotum, sometimes wanting, scutellum, postscutellum, rarely with a small spot on mesopleuræ, front legs, middle legs beyond coxæ, posterior trochanters, basal half of femora, tibiæ and tarsi, basal plates, venter of five basal abdominal segments, tergum of fourth and a band at middle and sides of first and third, sometimes narrowed to a line at middle, yellow; costa yellow, stigma pale at base; male differs in having pleuræ, pectus, all the coxæ, and abdomen beyond first segment, yellow or rufous; posterior and middle femora with a black line above, basal plates and first abdominal segment black; some specimens wholly yellow or rufous, except antennæ beyond second segment, spot on vertex, three spots on mesonotum, and base of abdomen, which are black. Length 11-13 mm. **verticalis**

17. Abdomen rufous beyond basal plates; body black, with two basal segments of antennæ, posterior orbits, tegulæ, scutellum, front and middle legs beyond coxæ except the tarsi, the posterior femora at base and the tibiæ, and the abdomen beyond the basal plates, rufous; clypeus, labrum, cheeks, collar, a spot above posterior coxæ, and tarsi, white. Length 12 mm. .... **ruficolor**

Abdomen black at base and apex, rufous at middle; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, spot above posterior coxæ, legs except apical half of posterior femora and ring at apex of tibiæ, and the basal plates, yellow; two basal segments of antennæ and abdominal segment four and a part of three and five, yellowish rufous; wings hyaline. Length 12 mm. .... **bifasciata**

18. Abdomen wholly or in part rufous ....(See sec. 15) **signata**

Abdomen wholly black 19

19. Pectus black ....(See sec. 48) **rufipes**

Pectus rufous ....(See sec. 48) **rufopecta**

20. Head above antennæ more or less yellow.................. 21

Head above antennæ wholly black...................... 30

21. Abdomen wholly or in part pale........................ 22

Abdomen wholly black.................................. 29

22. Scutellum wholly or in part yellow...................... 23

Scutellum wholly black.................................. 26

23. Pleuræ and pectus black ....(See sec. 16) **verticalis**

Pleuræ and pectus pale.................................. 24

24. Abdomen wholly pale beyond the basal plates............. 25

Abdomen with first three abdominal segments black; body black, with clypeus, labrum, mandibles, cheeks, face around and beneath antennæ, inner orbits, a line near occiput, tegulæ, collar, spot on sides of scutellum, spot on pleuræ, coxæ, trochanters, front legs in great part, middle femora, basal third of posterior femora, venter of abdomen, and edge of basal plates, white; middle tibiæ and tarsi, posterior femora and tibiæ in great part, and five apical abdominal segments, rufous. Length 13 mm. ....**formosa**

25. Scutellum smooth, polished, impunctate; body rufous or yellow, with an irregular spot above ocelli, a spot on the center of each lobe of mesonotum, basal plates for the most part, a small spot on the posterior coxæ, trochanters, and base of femora above, black. Length 13 mm. ....**rubripes**

Scutellum finely, densely punctate; body black, clypeus, labrum, mandibles, cheeks, orbits, posterior margin of postocellar area, supraclypeal area, collar broadly, tegulæ, V-spot, scutellum, postscutellum, pleuræ except sutural lines, pectus, legs except a black line above on femora, and abdomen except basal plates, yellow. Length 12 mm. **causata**

26. Posterior coxæ black at base; body black, with clypeus, labrum, mandibles, cheeks, orbits except at top of eyes, V-spot, spot on side of pronotum, collar, tegulæ, an angular mark on pleuræ, pectus in part, spot above posterior coxæ, sides of basal plates, apical portion of coxæ, trochanters, femora except above, front and middle tibiæ and tarsi except above, and basal half of abdomen beneath, white; abdomen rufous beyond second segment. Length 10 mm. ....**angulata**

Posterior coxæ wholly pale................................ 27

27. Posterior orbits black; body black, with clypeus, labrum, mandibles, face above and beneath antennæ, inner orbits, tegulæ, collar, angular spot on pleuræ and the basal half of venter, white; legs whitish except a black line at apex of anterior femora and base of tibiæ above, middle femora and tibiæ above, posterior femora and tibiæ for the most part; five apical segments of abdomen rufous. Length 13 mm. ....**eximia**

Posterior orbits wholly pale.............................. 28

28. Abdomen with four basal segments black; body black, with clypeus, labrum, mandibles, face above and below antennæ, anterior and posterior orbits, collar, tegulæ, spot on pronotum, pleuræ for the most part, pectus and sides of basal plates, white; legs yellowish rufous, except apex of front femora above, basal half of front and middle tibiæ above, middle and posterior femora above, and basal third of posterior tibiæ, which are black. Length 13 mm. ....**simulata**

Abdomen with three basal segments black; body black, with clypeus, labrum, mandibles, face above and below antennæ, anterior and posterior orbits, collar, tegulæ, pronotum at sides, pleuræ for the most part, and pectus, yellow; legs yellow, except line on front femora at apex above, front tibiæ above, middle femora and tibiæ above, and hind femora and greater part of tibiæ, which are black; abdomen rufous, except basal plates and three tergal segments. Length 12 mm. .... **secunda**

29. Pleuræ black; body black, with clypeus, labrum, mandibles, orbits entirely except above, face about and beneath antennæ, collar, tegulæ, margin of pronotum, V-spot, vittæ on mesonotum, metanotum at sides, spot above posterior coxæ, front legs except line above, middle legs beyond coxæ except greater part of femora and tibiæ above, hind legs beyond coxæ except femora and tibiæ above at apex, pale yellow. Length 14 mm. .... **lobata**

Pleuræ with a large angular white spot; body black, with clypeus, labrum, mandibles, orbits except above, broadly behind, face above and below antennæ, collar, tegulæ, lateral margin of pronotum, V-spot above posterior coxæ, large angulate spot on pleuræ, pectus in great part, front legs except point above at apex, middle legs except apical half of femora and tibiæ above, hind legs except apical half of femora and tip of tibiæ, and abdomen beneath, white. Length 14 mm. .... **angulifera**

30. Abdomen in part pale 31
Abdomen, including venter, black 45

31. Tergum in part pale 32
Tergum wholly black 44

32. Mesopleuræ wholly or in part pale 33
Mesopleuræ wholly black 42

33. Pectus pale 34
Pectus black 41

34. Posterior femora wholly or in part pale above 35
Posterior femora wholly black above 39

35. Posterior femora wholly pale 36
Posterior femora in part black 38

36. Abdomen wholly or in part black 37

Abdomen wholly rufous; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, sides of pronotum, lower half of mesopleuræ, pectus, spot above posterior coxæ, sides of basal plates, coxæ, trochanters, remainder of front legs except a line above on femora, white; remainder of legs except a line above on middle femora, and abdomen beyond basal plates, rufous. Length 11 mm. .... **frigida**

37. Abdomen wholly black above; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, narrow line on pleuræ, spot above posterior coxæ, sides of basal plates, and a narrow band along the side of the abdomen, white; legs rufous with tip of middle femora, apex of posterior femora, and apical half of posterior tibiæ black; pectus more or less rufous. Length 11 mm. .... **lineata**

Abdomen black, with at least the second and third tergal segments rufous; body black, with clypeus, labrum, mandibles, cheeks, dot at base of antennæ, collar, tegulæ, side of pronotum, angulate spot on pleuræ, pectus, spot above posterior coxæ, and four anterior coxæ, yellow; legs except a spot on tip of anterior femora and apical half of posterior tibiæ and tarsi, and the second, third, and part of the fifth abdominal tergite, and all the sternites except the two apical, rufous. Length 12 mm. .... **rufopedibus**

38. Front and middle legs with a black line above. (See sec. 15) **signata**

Front and middle legs wholly pale; body black, with clypeus, labrum, mandibles, cheeks, inner orbits narrowly, collar, tegulæ, line on mesopleuræ, pectus in part, spot above posterior coxæ, coxæ, and trochanters, yellow; legs except the parts named and apices of posterior femora and tibiæ and their tarsi, and abdomen beyond basal plates, rufous. Length 12 mm. .... **pallicola**

39. Posterior tibiæ black at apex.............................. 40

Posterior tibiæ wholly pale; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, spot on lower edge of pronotum, spot on pleuræ, pectus, spot above posterior coxæ, sides and posterior margin of basal plates, coxæ and trochanters except a black line above, front femora except a black line above, yellow; remainder of legs except a black line above on femora and the posterior tarsi entirely, and abdomen beyond basal plates, rufous. Length 12 mm. .... **hyalina**

40. Abdomen black at base only ....(See sec. 15) **signata**

Abdomen black at base and apex; body black, with clypeus, labrum, cheeks, collar, tegulæ, spot on mesopleuræ, spot above posterior coxæ, legs (except a black line above as far as apex of femora, apical three-fourths of posterior tibiæ, and their tarsi) yellow, shading to rufous on the posterior legs; abdomen with segments two to five rufous. Length 13 mm. .... **slossoni**

41. Abdomen rufous beyond first segment; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, spot on mesopleuræ, lower margin of pronotum, caudal margin of mesopleuræ, spot above posterior coxæ, sides of basal plates, front and middle legs except a black line above to the apex of tibiæ, posterior coxæ above and beneath, and a line beneath on the posterior femora and tibiæ, yellow. Length 13 mm. .... **junghannsii**

Abdomen rufous beyond third segment; body black, with clypeus, labrum, mandibles, cheeks, collar and tegulæ narrowly, a spot on mesopleuræ, a spot above posterior coxæ, front and middle legs except a black line to the base of tibiæ, the apical half of the posterior coxæ, the posterior trochanters, the basal third of the posterior femora, and venter of three basal abdominal segments, yellowish white. Length 12 mm. .... **nova**

42. Pectus black 43

Pectus pale; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, spot above posterior coxæ, pectus, anterior coxæ, and trochanters, white; legs except apical half of posterior tibiæ and their tarsi, and second to fourth segments of abdomen, rufous. Length 12 mm. .... **varians**

43. Posterior tibiæ wholly black; body black, with clypeus, labrum, mandibles, cheeks, spot above posterior coxæ, front and middle legs except a black line above beyond coxæ, yellow; posterior femora and abdomen beyond second segment rufous. Length 12 mm. .... **mutans**

Posterior tibiæ wholly pale; body black, with clypeus, labrum, mandibles except at apex, cheeks, collar, a spot above posterior coxæ, and sides of basal plates, white; tegulæ, legs except anterior coxæ above and femora in great part, and abdomen beyond fourth segment, rufous. Length 12 mm. .... **montana**

44. Pectus rufous ....(See sec. 48) **rufopecta**

Pectus black ....(See sec. 48) **rufipes**

45. Legs black, varied with white or yellow.................. 46

Legs rufous, varied more or less with black or yellow...... 48

46. Posterior tibiæ in part pale.............................. 47

Posterior tibiæ wholly black; body black, with clypeus, labrum, mandibles, cheeks, collar, tegulæ, spot above posterior coxæ, sides of basal plates, anterior pair of legs for the most part, middle tibiæ at tip, and tarsi at apex, white; wings clouded toward apex. Length 12 mm. ...... **flavomarginis**

47. Scutellum and mesopleuræ black; body black, with clypeus, labrum, mandibles, collar, spot above posterior coxæ, sides of basal plates, front femora beneath, front tibiæ except at apex above, middle tibiæ beneath, posterior tibiæ except apical third, and tarsi, white. Length 13 mm. **cinctitibiis**

Scutellum and mesopleuræ in part pale; body black, with clypeus, transverse line on vertex, labrum, collar, tegulæ, a spot on mesopleuræ, scutellum, two spots on basal plates, and a spot on posterior coxæ, white; legs black, with spot on front and hind coxæ, trochanters, front tibiæ before, band on middle and hind tibiæ, and bases of all the tarsal segments, white. Length 12 mm. .... **decorata**

48. Pectus rufous; body black, with clypeus, labrum, mandibles, line on collar, tegulæ, spot above posterior coxæ, and some-

times narrow apical margin of abdominal terga, white; pleuræ, pectus, and legs (except tips of the posterior femora, apical half of the tibiæ, and their tarsi) rufous. Length 13 mm..... **rufopecta**

Pectus black; body black, with clypeus, labrum, mandibles, and a spot above posterior coxæ, yellow; legs, except apical half of posterior tibiæ and their tarsi, rufous. Length 13 mm. ....**rufipes**

T. rufopecta (Norton). Howard, Insect Book, Pl. xiii, Fig. 16. Connecticut (E. N.); New Haven, 1 June, 1911 (A. B. C.).

°**T. fernaldi** MacGillivray.

°**T. dubitata** MacGillivray.

°**T. mellina** (Norton).

°**T. redimacula** MacGillivray.

°**T. neoslossoni** MacGillivray.

°**T. nigricollis** Kirby

*__T. grandis__ (Norton). Howard, Insect Book, Pl. xiii, Fig. 30. Farmington (E. N.).

°**T. antennata** Kirby.

°**T. semicornis** Harrington.

°**T. jocosa** Provancher.

°**T. signata** (Norton).

°**T. bilineata** MacGillivray.

T. verticalis Say. Howard, Insect Book, Pl. xiii, Fig. 32. Connecticut (E. N.); West Haven, 27 June, 1905 (H. L. V.); New Haven, 14 July, 1908 (B. H. W.), 30 May, 1911 (A. B. C.).

°**T. ruficolor** Norton.

°**T. bifasciata** (Say). *Allantus bifasciatus* Say. *Macrophya bifasciata* Say.

T. rufipes Say. Howard, Insect Book, Pl. xiii, Fig. 23. New Haven, 9 June, 1911 (A. B. C.).

°**T. formosa** Norton. Howard, Insect Book, Pl. xiv, Fig. 18.

°**T. rubripes** MacGillivray.

°**T. causata** MacGillivray.

°**T. angulata** Norton.

°**T. eximia** Norton.

°T. **simulata** MacGillivray.

°T. **secunda** MacGillivray.

*T. **lobata** (Norton). Howard, Insect Book, Pl. xiii, Fig. 4. Farmington (E. N.); Westville, 11 June, 1905 (W. E. B.).

T. **angulifera** (Norton). Connecticut (E. N.).

°T. **frigida** MacGillivray.

°T. **lineata** Provancher.

°T. **rufopediba** Norton.

°T. **pallicola** MacGillivray.

°T. **hyalina** MacGillivray.

°T. **slossoni** MacGillivray.

°T. junghannsii MacGallivray.

°T. **nova** MacGillivray.

°T. **varians** Norton.

°T. **mutans** Norton.

°T. **montana** Provancher.

*T. **flavomarginis** (Norton). Farmington (E. N.).

°T. cinctitibiis Norton. Howard, Insect Book, Pl. xiii, Fig. 25.

°T. **decorata** Provancher.

Labidia Provancher.

°L. **originalis** (Norton). *Allantus originalis* Norton.

Body black, with the clypeus, labrum, mandibles at base, collar broadly, scutellum, postscutellum, a spot on the outer side of posterior coxæ, anterior and middle femora beneath, tibiæ except a ring on the apex of the posterior pair, tarsi, basal plates, apical half of each abdominal segment, interrupted at middle on the first and second segments, yellow; body finely, densely punctate; veins and stigma rufous. Length 10 mm.

Macrophya Dahlbom.

Key to Species.

1. Antennæ wholly black 2
   Antennæ not wholly black 27

2. Scutellum white or yellow.................................. 3
Scutellum wholly black.................................. 10

3. Mesopleuræ wholly black.................................. 4
Mesopleuræ with a white or yellow spot.................. 7

4. Abdomen in part rufous or brownish...................... 5
Abdomen wholly black.................................. 6

5. Abdomen dorsally and ventrally with segments two, three, and four brownish; body black, with front and middle legs, tegulæ, and base of wings, brownish; collar, scutellum, a large spot on side of posterior coxæ, their apices, basal third of posterior femora, and tarsi beyond basal three-fourths of first segment, white; wings hyaline. Length 8 mm.........**nidonea**
Abdomen rufous beyond basal plates; body black, with clypeus, labrum, mandibles at base, collar, tegulæ, scutellum, front legs except coxæ in part above and tibiæ at apex beneath, middle legs except a ring on apex of tibiæ, posterior legs (except basal half of coxæ, apical two-thirds of femora and a ring at their base, apical third of tibiæ, and basal half of metatarsus), white; mesopleuræ uniformly densely punctate. Length 8 mm. ....**ornata**

6. Middle legs beyond coxæ in part black; body black, with clypeus, labrum, collar, two spots on postocellar area, tegulæ, scutellum, front coxæ at apex, front femora and tibiæ beneath, front tarsal segments at base, middle coxæ at apex, middle trochanters, middle femora at extreme base and apex, middle tibiæ except at apex, middle tarsi except at apex, a spot on side and apex of hind coxæ, hind trochanters, middle of hind tibiæ, hind metatarsi except extreme base and apex, hind tarsi at apex, and basal plates at middle, white; veins black; wings smoky; head closely punctate, with an impunctate area on each upper orbit. Length 9-10 mm. .... **epinota**
Middle legs beyond apices of coxæ wholly yellow; body black, with clypeus, labrum, collar, tegulæ, scutellum, front and middle legs beyond apices of coxæ, apices of hind coxæ, hind trochanters, basal half of hind femora, hind tibiæ except apical third, hind tarsi, and basal plates, yellow; stigma and veins brownish; head densely, finely punctate, with minute impunctate areas on the upper orbits. Length 8 mm. ....**texana**

7. Abdomen rufous beyond first segment; body black, with clypeus, labrum, collar, tegulæ, scutellum, oblique spot on pleuræ, front and middle legs, hind coxæ and hind trochanters, basal half of hind femora, band on middle of hind tibiæ, and hind tarsi except apex of apical segment, yellow or white. Length 8-9 mm. ....**trosula**
Abdomen wholly black.................................. 8

8. Antennal area without an impunctate area; body black, with clypeus, labrum, collar broadly, tegulæ, scutellum, postscutellum, round spot on mesopleuræ, front and middle legs except apical third of femora and extreme base and apex of tibiæ, basal plates, and last abdominal segment, yellow; stigma and veins brownish; mesopleuræ above the yellow spot much more densely punctate than below. Length 10 mm. .... **alba**

Antennal area with a small impunctate area 9

9. Mesopleuræ with upper half more coarsely and densely punctate than lower half; basal plates yellow; body black, with clypeus, labrum, collar, tegulæ, scutellum, an oblique band on pleuræ frequently interrupted, apices of front coxæ, front femora beneath, front tibiæ beneath and at base, front tarsal segments except at apex, middle coxæ in great part, middle trochanters, middle femora on basal half, middle tibiæ and tarsi except a ring at apex, hind coxæ and hind trochanters, basal third of hind femora, hind tibiæ except a ring at base and the apical fourth, a ring on middle of hind metatarsi, basal plates, and last abdominal segment, yellowish; wings smoky, veins and stigma brownish. Length 10 mm. .... **pulchella**

Mesopleuræ with upper half slightly more coarsely but no more densely punctate than lower half; basal plates wholly black; body black, with clypeus, labrum, mandibles at base, collar, tegulæ, scutellum, an oblique band on the mesopleuræ frequently interrupted, front and middle legs except tips of femora and tibiæ above and apices of tarsal segments, hind legs (except apical half of femora, a ring at base of tibiæ, apical fifth of tibiæ, and apices of tarsal segments), and an oblique band on apex of metapleuræ, yellow or white; wings hyaline. Length 8-9 mm. .... **confusa**

10. Abdomen wholly black 11

Abdomen more or less pale; body black, with front and middle tibiæ beneath and three basal segments of abdomen, piceous; wings infuscated, veins black, stigma piceous. Length 12 mm. .... **dejecta**

11. Posterior tibiæ in part pale 12

Posterior tibiæ wholly black 21

12. Posterior tibiæ banded with pale at middle 13

Posterior tibiæ with an outer pale line or spot, sometimes indistinct 19

13. Mesopleuræ with a white or yellow spot 14

Mesopleuræ wholly black 15

14. Mesopleuræ more densely punctate on upper half than on lower half; body black, with clypeus, labrum, mandibles

at base, collar, tegulæ, line on pleuræ, front legs beneath and base of femora and tibiæ above, middle legs except at apex of femora above and a ring on apices of tibiæ and apices of tarsal segments, hind legs (except base of coxæ, apical two-thirds of femora, ring at base and apical fourth of tibiæ, and ring on apices of tarsi) white. Length 9 mm. .... **lineata**

Mesopleuræ uniformly densely punctate; body black, with clypeus, labrum, collar, tegulæ, round spot on pleuræ, front and middle femora, hind legs with apices and spot on side of coxæ, trochanters, ring on base and apex of femora, middle of tibiæ, tarsi with ring at apex of each segment and base of metatarsus, white. Length 9 mm. **punctata**

15. Antennal area no more densely punctate than postocellar area 16

Antennal area distinctly more densely punctate than postocellar area 17

16. Antennal area with a distinctly rounded, pit-like median fovea; body black, with apex of labrum, collar and tegulæ narrowly, front legs beyond coxæ and beneath except basal third of femora, middle legs beyond coxæ (except femora, ring at apex of tibiæ, and apices of tarsi), an elongate spot on hind coxæ, their apices, hind tarsi except at apices of segments, basal half of hind metatarsi, and hind margin of basal plates, white. Length 9 mm. ...... **mixta**

Antennal area without any indication of a median fovea; body black, with clypeus, labrum, mandibles at base, line on collar and tegulæ, front and middle legs beneath except middle femora, an elongate spot on hind coxæ, hind trochanters, ring at base of hind femora, ring at middle of hind tibiæ, hind tarsal segments except ring at apex, and hind margin of basal plates, white. Length 10-11 mm. **pannosa**

17. Posterior coxæ black, with a large outer white or yellow spot 18

Posterior coxæ, except at tip, wholly black; body black, with clypeus, labrum, collar tegulæ, legs (except base of coxæ, apex of front femora and tibiæ above, apex of middle femora and tibiæ, apex of hind femora, base and apex of hind tibiæ and hind tarsi), and basal plates, yellow. Length 10 mm. .... **proximata**

18. Front and middle femora black on basal half; body black, with clypeus, labrum, collar, tegulæ, apical half to two-thirds of coxæ, trochanters, apical fifth of front and middle femora, front and middle tibiæ except a line above and a ring at apex, front and middle tarsi except at apex, basal fourth of posterior femora, a ring on middle of posterior tibiæ, and tarsi except at apex, yellow. Length 10 mm. .**flavicoxa**

Front and middle femora wholly yellow; body black, with clypeus, labrum, collar, tegulæ, front and middle legs except a ring at apex of tibiæ and apex of tarsi, posterior coxæ, trochanters, basal half of femora, median half of tibiæ, and tarsi except at apex, yellow. Length 10 mm. **incerta**

19. Posterior coxæ wholly black; body black, with clypeus, labrum, line on collar, tegulæ, trochanters, a ring on base and apex of femora, front and middle tibiæ and tarsi beneath, and a line on hind tibiæ, white; scutellum densely punctate. Length 10-11 mm. .... **externa**

Posterior coxæ black, with a white spot on the side 20

20. Posterior orbits as densely punctate as the antennal area; body black, with clypeus, labrum, two spots on occiput, very narrow line on collar and tegulæ, a spot on the outer side of coxæ, trochanters, apical half of front and middle femora beneath, front and middle tibiæ beneath, front and middle tarsi except a ring at apices of segments, posterior tibiæ on upper median half, and hind margin of the basal plates, white. Length 10 mm. .... **tibiator**

Posterior orbits not as densely punctate as the antennal area; body black, with clypeus, labrum, narrow line on collar, tegulæ, front coxæ beneath, a spot on side of middle and hind coxæ, trochanters, front femora at apex beneath, front and middle tibiæ beneath, front and middle tarsi beneath, posterior tibiæ at middle above, and posterior tarsi beyond the apex of the metatarsi except a ring at apex of each segment, white. Length 9 mm. .... **bilineata**

21. Posterior legs wholly black; body black, with base of mandibles, apical half of front femora, and tibiæ beneath, white; body strongly punctate throughout; wings fuliginous. Length 12 mm. .... **fuliginea**

Posterior legs in part white or yellow...................... 22

22. Posterior coxæ wholly or in great part pale................. 23

Posterior coxæ black, with an outer pale mark 24

23. Anterior tibiæ wholly yellow (male) .... **flavicoxa**

Anterior tibiæ with a black line above (male) .... **incerta**

24. Head with an impunctate area below median ocellus; body black, with clypeus, labrum, mandibles at base, line on collar, tegulæ, coxæ at apex and a spot on outer margin, trochanters, apical half of anterior femora beneath, anterior tibiæ beneath, apical half of middle tibiæ beneath, tarsi except a ring at apices of segments, and posterior metatarsi, white; postocellar area distinctly separated from upper orbits. Length 11-12 mm. .... **propinqua**

Head without an impunctate area below median ocellus..... 25

25. Postocellar area densely punctate throughout.............. 26

Postocellar area sparsely punctate, except on its occipital margin; body black, with clypeus, labrum, mandibles at base, front coxæ in great part beneath, middle coxæ at apex, hind coxæ at apex, and a large spot on outer side, trochanters, front femora at apex beneath, front and middle tibiæ beneath, and tarsi except apices of segments and posterior metatarsi, white; upper orbits with a large impunctate area. Length 8 mm. ....**contaminata**

26. Mesopleuræ more densely punctate on upper portion than lower; body black, with clypeus, labrum, mandibles at base, narrow line on collar and tegulæ; front and middle legs beneath except base of coxæ, a large spot on side of hind coxæ, hind trochanters, and hind tarsi beyond the metatarsi, white; upper orbits with a large impunctate area. Length 8 mm. ....**albomaculata**

Mesopleuræ uniformly densely punctate throughout; body black, with tip of labrum, front and middle legs beneath beyond middle of coxæ, apices and a large spot on outer side of hind coxæ, and hind trochanters, white; front, postocellar area, and upper orbits almost uniformly finely punctate ....**minuta**

27. Antennæ pale at base or apex.......................... 28

Antennæ pale at base and apex.......................... 37

28. Antennæ pale at apex 29

Antennæ pale at base 31

29. Collar black; body black, with antennæ at apex, labrum in part, trochanters, front legs beyond middle of femora beneath, middle legs beyond basal two-thirds beneath, and a large spot on the side of the posterior coxæ, white; head uniformly densely punctate. Length 10 mm. ....**nigra**

Collar broadly white.................................... 30

30. Middle of head between antennal furrows distinctly elevated; posterior orbits polished and obsoletely punctate; body black, with apex of antennæ, clypeus, labrum, base of mandibles, collar broadly, V-spot, a triangular spot on pleuræ, sometimes a mere dot, or wanting, an elongate dot at base of each wing, sometimes wanting, scutellum, front and middle legs (except femora and tibiæ above, a ring at apex of tibiæ, and rings at apices of tarsal segments), a spot on side of hind coxæ, hind trochanters, hind femora beneath, venter of abdomen, and dorsal apical margin of segments, enlarged at sides (apical margin sometimes wanting), white. Length 11 mm. ....**zonalis**

Middle of head between antennal furrows not decidedly elevated; posterior orbits distinctly punctate; body black, with antennæ at apex, clypeus, labrum, mandibles at base, collar, V-spot, sometimes wanting, scutellum, front legs beyond basal third of femora beneath, tarsal segments at base, middle femora at apex beneath, middle tibiæ in part beneath, middle tarsal segments at base, a spot on hind coxæ, hind trochanters, hind femora beneath, and apical margins of abdominal segments, white. Length 10-11 mm. **trisyllaba**

31. Abdomen wholly or in part rufous 32
Abdomen wholly black, or black marked with white 34

32. Abdomen wholly rufous; body black, with clypeus, labrum, mandibles at base, collar, tegulæ, V-spot, scutellum, postscutellum, angular spot on pleuræ, front legs entirely, middle legs except a black line on femora, posterior coxæ except a black line, trochanters, basal third of femora, a stripe at middle above on posterior tibiæ, and posterior tarsi beyond middle of metatarsi, white; two basal segments of antennæ, abdomen including basal plates except saw-guides, posterior two-thirds of femora, posterior tibiæ at base and apex, and basal half of posterior metatarsi, rufous. Length 8 mm. ....**goniphora**
Abdomen wholly or in part rufous beyond second segment.. 33

33. Vertical furrows not distinct and line-like; body black, with two basal segments of antennæ, clypeus, labrum, mandibles, collar broadly, tegulæ, V-spot, scutellum, postscutellum, round spot on pleuræ, posterior margin of mesopleuræ, legs except apex of posterior femora and tibiæ, and basal plates, yellow; abdomen usually with the third, fourth, and fifth dorsal segments, rufous. Length 9-10 mm. ....**intermedia**
Vertical furrows distinct, line-like; body black, with two basal segments of antennæ, clypeus, labrum, mandibles at base, spot on supraclypeal area, collar broadly, tegulæ, scutellum, postscutellum, rounded spot on pleuræ, spot at base of hind wings, legs (except basal half of hind coxæ, apical half of hind femora, and ring at apex of hind tibiæ), yellow; fourth and fifth segments of tergum rufous. Length 12 mm. ....**formosa**

34. Head uniformly densely punctate 35
Head with upper orbits not as densely punctate as antennal area 36

35. Abdomen wholly black; body black, with two basal antennal segments, collar, a spot below collar on pleuræ, front and middle legs beyond coxæ except a band at middle of femora, apices of posterior coxæ, their trochanters, a ring on base of femora, tibiæ except a ring at apex, tarsi in part, and basal plates, white; body coarsely punctate. Length 8 mm. ....**cesta**

Abdomen black, apical margin of segments margined with yellow; body black, with two basal segments of antennæ, clypeus, labrum, mandibles at base, collar broadly, tegulæ, rounded spot on mesopleuræ, legs beyond apices of coxæ except apex of posterior femora and tibiæ, basal plates, and dorsal apical margin of abdominal segments, broader behind, white or yellow. Length 9 mm. .... **succincta**

36. Postocellar area separated from posterior orbits by deep, well-marked vertical furrows; body black, with two basal segments of antennæ, clypeus, labrum, V-shaped spot on collar, tegulæ, scutellum, legs beyond apices of coxæ except apices of posterior femora and tibiæ, an elongate spot on outer upper side of posterior coxæ, and basal plates, yellow; upper orbits polished, almost entirely without punctures. Length 11 mm. .... **melanopleura**

Postocellar area not distinctly separated from upper orbits, vertical furrows feeble .... (See sec. 33) **intermedia**

37. Pleuræ with a large oblique white mark; body black, with apex of antennæ, supraclypeal area, clypeus, labrum, mandibles at base, pronotum in great part, V-spot, scutellum, postscutellum, large mark on pleuræ, spot at base of hind wings, front and middle coxæ, trochanters, and basal half of femora, a spot on hind coxæ, their apices, trochanters and basal half of femora, and basal plates in part, white; two basal segments of antennæ, tegulæ, remainder of legs except apical half of femora, and abdomen except basal plates in part and tergum of first segment, rufous. Length 10 mm. .... **fascialis**

Pleuræ wholly black; body black, with apex of antennæ, clypeus, labrum, mandibles at base, collar, V-spot, scutellum, postscutellum, apical half of front and middle coxæ, front and middle trochanters, basal half of front and middle femora, hind coxæ beneath and a large spot on the outer side, hind trochanters, basal half of hind femora, and hind tarsi, white; basal segment of antennæ, tegulæ, remainder of legs except apices of tibiæ, and abdominal segments two to five, rufous. Length 10 mm. .... **varia**

°**M. nidonea** MacGillivray.

°**M. ornata** MacGillivray.

M. epinota (Say). Connecticut (E. N.); Hartford (Nason).

°**M. texana** Cresson.

M. trosula (Say). Connecticut (E. N.); New Haven, 30 May, 1910 (W. E. B.).

M. alba MacGillivray. *Macrophya pulchella* var. *alba* MacGillivray. *Macrophya zonata* Konow. New Haven, 21 May, 1910 (A. B. C.).

M. pulchella (Klug). Connecticut (E. N.).

°**M. confusa** MacGillivray.

°**M. dejecta** (Norton).

***M. lineata** Norton. Connecticut (E. N.); Farmington; New Haven, 1 June, 1908, Westville, 2 June, 1908 (B. H. W.); Hamden, 25 May, 1911 (A. B. C.).

°**M. punctata** MacGillivray.

°**M. mixta** MacGillivray.

M. pannosa (Say). Yalesville, 26 May, 1908, 17 June, 1907 (B. H. W.).

***M. proximata** Norton. Connecticut (E. N.).

***M. flavicoxa** (Norton). Larva feeds on elder. Connecticut (E. N.); Waterbury, 9 June, 1905 (W. E. B.); New Haven, 21 May, 1910 (A. B. C.).

***M. incerta** (Norton). Howard, Insect Book, Pl. xiv, Fig. 20, Connecticut (E. N.).

M. externa (Say). Larva feeds on hickory. Connecticut, (E. N.); Poquonock, 27 June, 1905 (B. H. W.); New Haven, 14 June, 1910 (A. B. C.), 26, 30 May, 1911 (A. B. C. and B. H. W.); Hamden, 25 May, 1911 (B. H. W.).

M. tibiator Norton. Larva feeds on elder. Connecticut (E. N.); Westville, 2 June, 1908 (B. H. W.).

M. bilineata MacGillivray. Larva feeds on *Viburnum*. Milldale, 21 May, 1906 (B. H. W.).

M. fuliginea Norton. New Haven, 17 June, 1905 (H. L. V.).

°**M. propinqua** Harrington.

°**M. contaminata** Provancher.

***M. albomaculata** (Norton). Connecticut (E. N.).

M. minuta MacGillivray. Orange, 4 July, 1910 (B. H. W.).

***M. nigra** (Norton). Farmington (E. N.); Hamden, 1 June, 1911, New Haven, 28 June, 1911 (A. B. C.).

°**M. zonalis** Norton.

***M. trisyllaba** (Norton). Howard, Insect Book, Pl. xiii, Fig. 8. Larva feeds on elder. Connecticut (E. N.); New Haven, 27 June, 1902 (E. J. S. M.).

M. goniphora (Say). Connecticut (E. N.); Hamden, 1 June, 1911 (A. B. C.).

***M. intermedia** (Norton). Connecticut (E. N.).

M. formosa (Klug). Howard, Insect Book, Pl. xiv, Fig. 25. Connecticut (E. N.); New Haven, 8 June, 1904 (W. E. B.), 4 July, 1905 (H. L. V.), 20 July, 1904 (B. H. W.), 24 June, 1902 (E. J. S. M.).

°**M. cesta** (Say).

M. succincta Cresson. Stonington, 8, 14, June, 1906 (W. E. B.); New Haven, 25 June, 1907 (B. H. W.), 6 June, 1908 (W. E. B.), 26 May, 1911 (A. B. C.).

°**M. melanopleura** MacGillivray.

***M. fascialis** Norton. Farmington (E. N.); New Haven, 4 July, 1905 (H. L. V.).

***M. varia** (Norton). Farmington (E. N.).

Allantus Jurine.

Key to Species.

1. Female: posterior femora pale at base and black at apex, or black above and pale below; body black, with clypeus, labrum, mandibles, line on lower half of postgenæ adjacent to eyes, two basal segments of antennæ, collar, tegulæ, mesopleuræ broadly, scutellum, a spot above posterior coxæ, legs beyond coxæ (except middle femora at apex above, apical half of posterior femora, and a ring on apex of posterior tibiæ), basal plates, abdominal segments four, seven, and eight, and a spot on each side of fifth and sixth, yellow. Male differs in having only basal segment of antennæ, genæ, lower half of postgenæ, mesopleuræ entirely, sides of pronotum, metapleuræ, legs entirely except a black line above on middle and hind legs and hind tarsi, and abdomen beyond basal plates, white or yellow. Length 12 mm. ....**basilaris**

Female: posterior femora wholly black or rufous; body black, with clypeus, labrum, mandibles, genæ, lower half of postgenæ, spot on mesopleuræ, sometimes wanting, scutellum, trochanters, tibiæ, becoming rufous at apex, tarsi, basal plates, and abdominal segments five to seven with a short band interrupted at middle, yellow; antennæ, tegulæ, upper orbits at times, front femora, wings, veins, and stigma, rufous. Male differs in having antennæ black, front femora entirely and middle femora beneath pale, and abdominal segments two to four entirely yellow. Length 12 mm. **dubius**

A. basilaris (Say). Howard, Insect Book, Pl. xiii, Fig. 15. Connecticut (E. N.); New Haven (H. L. V.); Canaan (A. P. Morse); Prospect, 15 August, 1906, Hamden, 23 August, 1910 (W. E. B.).

A. dubius Norton. *A. robustus* Provancher. Scotland (B. H. W.); Colebrook, 20 July, 1905 (W. E. B.); Lyme, 31 July, 1910 (A. B. C.).

CIMBICINÆ.

Key to Genera.

1. Free part of 2d A present.................................. 2
   Free part of 2d A wanting, due to anastomosing of anal veins at middle ....**Abia** p. 102
2. Basal plates deeply emarginate at apex and filled with a chitinous membrane; hind femora not toothed..**Cimbex** p. 103
   Basal plates not or scarcely emarginate at apex and never with a chitinous membrane; hind femora more or less distinctly toothed beneath ....**Trichiosoma** p. 103

Abia Leach.

***A. inflata** (Norton). *Zarea inflata* Norton. Howard, Insect Book, Pl. xii, Fig. 8; Pl. xiii, Fig. 28.

Basal plates white; body bluish black, with the legs beyond the coxæ except the basal two-thirds of the front and middle femora, and the basal plates, white; the posterior femora sometimes infuscated above; third and following abdominal segments with a band of sericeous pile, in no case covering the entire segment. Length 11 mm. Larva feeds on honeysuckle.

Farmington (E. N.).

°**A. americana** (Cresson). *Zarea americana* Cresson. Howard, Insect Book, Pl. xiv, Fig. 21.

Basal plates not white; body greenish black, with the trochanters, apices of the femora, the tibiæ, and the tarsi, white; third and following abdominal segments with a band of sericeous pile covering practically the entire segment. Length 8-12 mm.

Trichiosoma Leach.

Key to Species.

1. Abdomen black, or at most with only the apex and lateral margins more or less rufous.......................... 2
   Abdomen entirely rufous, or at most with only first and second segments with bars of black; tibiæ and tarsi yellowish white; remainder of body black; pubescence of vertex black, of front, thorax, and base of abdomen, yellow; abdomen in great part bare, sides of segments with a short yellow pile with scattered longer hairs. Length 15-20 mm. ....**confusum**
2. Abdomen wholly black or at least the last segment in most part black 3
   Abdomen black with apex and lateral margin rufous, at least the apical segment always rufous; tibiæ and tarsi yellow; remainder of body black; pubescence of vertex and front woolly, black, mixed with a few yellow hairs; pubescence of thorax and abdomen long, yellow, woolly and matted. Length 20-25 mm. ....**triangulum**
3. Abdomen densely covered with short black pile; tibiæ and tarsi yellow; remainder of body black; pubescence of head and abdomen black; pubescence of thorax yellow, except a transverse band across the middle, which is black; abdomen short and broad, broadest at middle. Length 15 mm. ....**crassum**
   Abdomen covered with long, woolly, gray hair; tibiæ and tarsi yellow; tibiæ sometimes infuscated at base; remainder of body black; pubescence of entire body consisting of woolly gray hairs, more abundant on head and thorax; abdomen long and slender, sides parallel. Length 15-18 mm. ....**spicatum**

°**T. confusum** MacGillivray.

T. triangulum Kirby. Howard, Insect Book, Pl. xii, Fig. 5. Larva feeds on willow, wild cherry, poplar, alder. New Haven (F. E. Willits); Oxford, 21 May, 1904 (W. E. B.).

T. crassum W. F. Kirby. Lyme, 1 May, 1910 (A. B. C.).

°**T. spicatum** MacGillivray.

Cimbex Olivier.

Key to Species.

1. Tibiæ pale yellow; body black, with antennæ, tibiæ and tarsi yellow; prothorax, middle of abdominal segments two to five and part of following segments yellowish ferruginous;

broad band at sides of abdominal segments two to four and spot at sides of segment five, white. Length 16 mm. **semidea**

Tibiæ black 2

2. Abdominal segments never marked with white............ 3

Abdominal segments always marked at sides with white.... 5

3. Abdomen steel blue.. 4

Abdomen for the most part rufous (male) ..**americana** var. **laportei**

4. Wings for the most part hyaline; body steel-blue, with tarsi and antennæ beyond second segment yellow; head and thorax clothed with long black hairs (male). Length 20 mm. ....**americana**

5. Abdomen almost wholly steel-blue, with obscure spots on each side of fifth or fifth and sixth abdominal segments; body steel-blue, with the tarsi and the antennæ beyond the second segment, yellow; head and thorax more or less covered with long black hairs. Length 20-25 mm. (female)..**americana**

Abdomen steel-blue, with three or more distinct white spots 6

6. Abdomen with a white spot on each side of third, fourth, and fifth segments; wings violaceous (female) .... **americana** var. **nortoni**

Abdomen with more than three segments marked with white 7

7. Abdominal segments marked with small rounded spots...... 8

Abdominal segments marked with broad transverse bands... 9

8. Abdomen with white spots on each side of segments two to five; wings violaceous (female) ....**americana** var. **luctifera**

Abdomen with white spots on each side of segments two to six; wings hyaline (female) ....**americana** var. **decimaculata**

9. Abdomen with white bands on segments two to six; wings violaceous (female) ....**americana** var. **dahlbomii**

Abdomen with white bands on segments two to seven, frequently meeting at middle; wings hyaline (female) .... **americana** var. **alba**

°C. **semidea** Cresson.

C. **americana** var. **laportei** LePeletier. New Haven (F. E. Willits).

C. americana Leach. Howard, Insect Book, Pl. xii, Fig. 4 (male), Fig. 44, p. 74 (female). Larva feeds on willow, elm, poplar, alder, maple, and linden. Connecticut (E. N.); New Haven, 2 June, 1904 (H. L. V.); Woodmont (W. E. B.); Stonington, August, 1907 (G. H. Hollister).

*C. **americana** var. **nortoni** MacGillivray. Howard, Insect Book, Pl. xii, Fig. 1. Connecticut (E. N.).

°C. **americana** var. **luctifera** Kirby.

°**C. americana** var. **decimaculata** Norton.

°**C. americana** var. **dahlbomii** Guerin-Meneville.

°**C. americana** var. **alba** Norton.

HOPLOCAMPINÆ.

Key to Genera.

1. Claws bifid 3
   Claws never bifid 2
2. Claws simple, without a tooth on their inner margin **Marlattia** p. 105
   Claws with a minute, erect tooth at middle ...**Hoplocampa** p. 105
3. Front wings with the transverse part of M_2 received in cell R_4 some distance before the free part of the vein R_5.......... **Craterocercus** p. 105
   Front wings with the transverse part of M_2 either interstitial with the free part of R_5 or received in cell R_5 ....**Hemichroa** p. 106

Marlattia Ashmead.

°**M. laricis** (Marlatt). *Hemichroa laricis* Marlatt.

Body black, with the mouth-parts scarcely paler than the body-color or slightly reddish; tegulæ and legs beyond the coxæ strongly infuscated, pallid; wings infuscated; clypeus broadly, shallowly emarginate with a strong transverse ridge near the base; pentagonal area distinct, ridges somewhat rounded, median fovea shallow and circular; antennæ with fourth segment much longer than third; saw-guides short and rounded at tip. Length 5.5 mm. Larva feeds on larch.

Hoplocampa Hartig.

H. halcyon Norton.

Body ochreous, with the mesonotum, metanotum, and tergum of the abdomen black, or body sometimes entirely ochreous; clypeus distinctly emarginate; pentagonal area and median fovea wanting; third segment of the antennæ longer than the fourth, tooth of claws minute. Length 3.5 mm.

Lyme, 14 May, 1911 (A. B. C.).

Craterocercus Rohwer.

Key to Species.

1. Mesonotum and collar marked with white.................. 2
   Mesonotum and collar black; body black, with legs beyond femora white; third segment of antennæ shorter than

fourth; clypeus distinctly emarginate; median fovea large, shallow, circular; wings infuscated on basal half. Length 6 mm. .... **infuscatus**

2. Basal plates black.. 3

Basal plates white; body black, with edge of clypeus, labrum, tegulæ, collar, median lobe of mesonotum, lateral lobes in part, a band on the four basal segments of the tergum, edge of three apical segments, and legs, except a band on hind femora and the hind tarsi, white; third and fourth segments of antennæ subequal. Length 6 mm. (female) .... **albidovariatus**

3. Median lobe of mesonotum in great part white (male) **albidovariatus**

Median lobe of mesonotum with white lines, short and obscure .... **phytophagicus**

°**C. infuscatus** MacGillivray.

°**C. albidovariatus** (Norton). *Hemichroa albidovariata* Norton. Howard, Insect Book, Pl. xiv, Fig. 19 (female). Larva feeds on black oak.

°**C. phytophagicus** (Dyar). *Hemichroa phytophagica* Dyar. Larva feeds on white oak.

Hemichroa Stephens.

°**H. americana** (Provancher). *Dineura americana* Provancher.

Scutellum polished, impunctate; body of female rufous, with metathorax, antennæ, coxæ, trochanters, front femora at base, middle and posterior femora, tibiæ at tip, tarsi, and saw-guides, black; tibiæ white; wings infuscated, paler at apex; pentagonal area indistinct, walls flat; median fovea shallow, elongate; third and fourth segments of the antennæ subequal; body of male black, with legs beyond coxæ and tegulæ rufous. Length 5.7 mm. Larva feeds on alder; gregarious.

H. fraternalis Norton.

Scutellum uniformly finely punctate; body of female with the median lobe of the mesonotum, the lateral lobes in part, a large spot on the mesopleuræ, the venter of the abdomen, the basal plates, and more or less of each of the other tergal segments, rufous; prothorax for the most part, the tegulæ, the legs except the posterior femora, and the costa and stigma, white;

male differs in lacking the rufous and in having the femora in great part black. Length 9 mm. Larva feeds on white oak.

New Haven, 1907 (A. D. Reid), 21 May, 1910 (A. B. C.); Lyme 1 May, 1910 (A. B. C.).

DINEURINÆ.

Key to Genera.

Front wings with transverse part of M_2 interstitial with free part of R_5; free part of Sc_1 situated before the medio-cubital cross-vein ....**Mesoneura** p. 107

Front wings with transverse part of M_2 received in cell R_5 and never interstitial with free part of vein R_5; free part of Sc_1 interstitial with or situated beyond the medio-cubital cross-vein ....**Dineura** p. 107

Mesoneura Hartig.

***M. parva** (Norton). *Dineura parva* Norton.

Body black, with the tegulæ and the apex of the venter piceous; legs yellow-rufous; wings hyaline, the veins brown; antennæ filiform, third and fourth segments subequal; head without depressions about ocelli; clypeus truncate. Length 4 mm.

Farmington (E. N.).

Dineura Dahlbom.

Key to Species.

1. Antennæ with third segment longer than or subequal to fourth 2
   Antennæ with third segment shorter than fourth; body black, with legs beyond base of femora and apex of venter rufo-testaceous; wings hyaline, iridescent, veins brown, costal vein and stigma dull luteous. Length 5 mm. ....**luteipes**
2. Mesonotum more or less marked with rufous; body black, with prothorax, tegulæ, side lobes of mesonotum, pleuræ, legs, and apex of abdomen, rufous; wings hyaline, stigma pale, cell R_4 almost square. Length 5 mm. ....**linita**
   Mesonotum wholly black; body black, with tegulæ, collar, large spot on pleuræ, legs, apical half of tergum, and apical two-thirds of venter, rufous; basal half of stigma white; cell R_4 longer than wide. Length 4.5 mm. ....**lateralis**

°**D. luteipes** Cresson.

°**D. linita** Norton.

°**D. lateralis** Norton.

MONOCTENINÆ

Monoctenus Dahlbom.

Front wings with medio-cubital cross-vein in the angle between R + M and M; the free part of 2nd A wanting and the anal veins anastomosing at middle; radial cross-vein wanting; the antennæ with more than nine segments.

°**M. fulvus** (Norton.) *Lophyrus fulvus* Norton. Howard, Insect Book, Pl. xiv, Figs 11 and 16.

Body rufous, with a lunate mark about the ocelli, the antennæ, a spot on each lateral lobe, the metathorax in great part, the dorsal part of the mesopleuræ, the ventral margin of the mesopleuræ, the pectus, the venter of the abdomen, the basal plates and the first abdominal segment, black; varies until practically entire body except legs is black; antennæ with a variable number of segments. Length 8 mm.

CLADIINÆ.

Key to Genera.

1. Front wings with transverse part of M_2 received in cell R_4 .. 3

Front wings with transverse part of M_2 received in cell R_5.. 2

2. Claws simple ....**Anoplonyx** p. 108

Claws bifid ....**Platycampus** p. 109

3. Hind wings without an appendage at the apex of cell R_{1+2} .... **Priophorus** p. 109

Hind wings with an appendage at the apex of cell R_{1+2} 4

4. Front and middle metatarsi never more than one-half the length of their tibiæ; tarsal segments all of practically the same width throughout, segmentation indistinct; antennæ of male with prominent branches or projections at tip of basal segments at least ....**Cladius** p. 110

Front and middle metatarsi never more than one-third the length of their tibiæ; tarsal segments distinctly broader at apex than at base, segmentation very distinct; antennæ never with projections at apices of segments, male with a blunt projection at base of third segment beneath. .... **Trichiocampus** p. 110

Anoplonyx Marlatt.

°**A. canadensis** Harrington.

Body black, with edge of the clypeus, labrum, mandibles, tegulæ, and legs except coxæ, pale honey-yellow; veins, including costa and stigma, pale; body impunctate, pentagonal area distinct, not strongly marked; antennal segments three to five sub-equal; clypeus emarginate. Length 5 mm.

Platycampus Schiödte.

°**P. americanus** (Marlatt). *Camponiscus americanus* Marlatt.

Body rufous, with the antennæ above, spot about ocelli, tip of scutellum, postscutellum, metathorax more or less, hind coxæ, base of abdomen beneath, mesopleuræ more or less, femora more or less, apex of hind tibiæ, and hind tarsi, brownish or infuscated; pentagonal area sharply defined; frontal ridge strong, unbroken; median fovea broad and deep; antennal segments three and four subequal. Length 5-6 mm. Larva feeds on poplar.

Priophorus Latreille.

Key to Species.

1. Frontal crest never large and prominent and never extending laterally to eyes; entire free part of Sc_1 always distinct.... 2

Frontal crest large and prominent, extending laterally to eyes; free part of Sc_1 almost entirely atrophied; body black, with legs beyond knees semi-resinous to brown; clypeus transverse, deeply emarginate; antennal furrow extending as a groove along lateral margin of antenna to about the middle of the front, where it is interrupted by the frontal crest, then continued as a short groove behind the lateral ocelli; median fovea triangular, flat. Length 6 mm. **simplicicornis**

2. Frontal crest distinct or subdistinct; color black, with apical half of legs paler.. 3

Frontal crest wanting; ocellar furrow distinct; body resinous, with head except mouth, antennæ except two basal segments, and mesonotum and metanotum, black; clypeus shallowly emarginate with rounded lateral angles; antennal furrow continuous; median fovea shallow and indefinite; pentagonal area wanting; third antennal segment longer than fourth. Length 4 mm. ....**acericaulis**

3. Frontal crest broken by median fovea; sides of ocellar basin scarcely indicated; ocellar furrow distinct; body black, with legs beyond knees, four hind trochanters, and anterior femora on the sides, white; clypeus transverse and deeply emarginate; median fovea deeply concave; third and fourth antennal segments subequal. Length 6 mm. ....**æqualis**

Frontal crest entire, not broken by median fovea; sides of ocellar basin clearly distinguishable; ocellar furrow scarcely indicated; body black, with legs beyond knees white; clypeus transverse, deeply and roundly emarginate, lateral angles prominent; median fovea large, broad, shield-shaped; third and fourth antennal segments subequal. Length 7 mm. .... **solitaris**

P. **simplicicornis** (Norton). *Cladius simplicicornis* Norton. New Haven (A. E. V.)

*P. **acericaulis** MacGillivray. Larva a borer in the leaf-stems of the sugar maple. New Haven, Stonington (W. E. B.); Southington, New Haven (B. H. W.).

*P. **æqualis** (Norton). *Cladius æqualis* Norton. Farmington (E. N.).

°P. **solitaris** (Dyar). Larva feeds on alder.

Cladius Illiger.

C. pectinicornis Fourcroy. *Cladius isomera* Norton. Howard, Insect Book, Pl. xii, Fig. 19.

Body black, with the legs beyond the knees and the costa whitish; third segment of the antennæ shorter than the fourth; clypeus transverse, broad, shallowly emarginate; pentagonal area indistinct; frontal crest distinct and broadly broken; median fovea broad, flat, indistinct; antennæ of the male with projections at the apex of segments three to six, largest at base. Length 6-8 mm. Larva feeds on rose.

Farmington (E. N.); New Haven (H. L. V.), 6, 29 July, 1910 (W. E. B.); Orange, 21 May, 1911 (A. B. C.).

Trichiocampus Hartig.

T. viminalis Fallen. *Auliacomerus lutescens* Lintner.

Abdomen rufous; body black, with the antennæ, the legs, the pleuræ broadly, and the abdomen, rufous; third segment of the antennæ not as long as the fourth; pentagonal area distinct, the frontal crest broken, the median fovea large, elongate; basal two-thirds of the wings infuscated. Length 10 mm. Larva feeds on *Populus monilifera.* New Haven (W. E. B.)

°**T. gregarius** Dyar.

Abdomen black; body black, with the front and middle legs beyond the middle of their femora and the hind legs beyond the femora white; third and fourth segments of the antennæ subequal; pentagonal area distinct, the frontal crest slightly broken, the median fovea small, circular; basal two-thirds of the wings dark, smoky black. Length 6 mm. Larva feeds on *Populus tremuloides.*

NEMATINÆ.[*]

The types of the following species are not accessible and it is impossible to locate them in the tables.

Nematus (Pteronus?) longicornus Say.

Body black, with the postgenæ, orbits, face below the antennæ, the tegulæ, the angles of the pronotum, the pleuræ except two black spots, the body beneath, and the legs (except the apical half of the hind femora, their tibiæ, and their tarsi), whitish; antennal segments three and four subequal; clypeus angulately emarginate; male with the antennæ pale fulvous beneath; the third segment shorter than the fourth and curved at base. Length 12 mm.

Connecticut (E. N.).

***Nematus (Pachynematus) nigritus** Norton.

Body black, with the postgenæ, the clypeus, the labrum, the tegulæ, and the apex of the abdomen above and below, yellowish; the trochanters, the apical half of the femora, the tibiæ except the tips and base of the hind pair, reddish white; antennæ with the third segment shorter than the fourth; clypeus hardly emarginate. Length 12 mm.

Connecticut (E. N.).

Key to Genera.

1. Claws simple, without a tooth; clypeus emarginate; head with frontal area indistinct or wanting ...... **Diphadnus** p. 112
Claws with a tooth 2
2. Claws with a small, erect tooth at middle 3
Claws cleft at apex, the two rays usually subequal in length .. 5
3. Clypeus emarginate, sometimes very slightly; vertex with a fairly distinct frontal area; radio-medial cross-vein always present .... **Pachynematus** p. 115

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[*] In the preparation of the tables dealing with this subfamily free use has been made of a paper by C. L. Marlatt, "Revision of the Nematinæ of North America." Bull. No. 3, Technical Series, Bureau of Entomology, U. S. Dept. of Agriculture.

Clypeus squarely truncate; radio-medial cross-vein usually wanting 4

4. Frontal area of head more or less distinct; saw-guides simple; elongate species ....**Lygæonematus** p. 115

Frontal area entirely wanting; saw-guides with a distinct scopa; short, ovate species ....**Pristiphora** p. 113

5. Front wings with free part of R_3 always present and the cells R_3 and R_4 therefore always separate 6

Front wings with free part of R_3 always wanting and the cells R_3 and R_4 therefore always united ....**Euura** p. 141

6. Antennæ of female filiform, of practically the same width throughout; eighth dorsal segment of abdomen of male with a small, blunt, more or less awl-shaped projection; small species ....**Pontania** p. 137

Antennæ of female setaceous, distinctly tapering toward apex; eighth dorsal segment of abdomen of male with a broad, obtusely pointed projection, or not at all produced at the tip; usually larger than 5 mm. 7

7. Hind tibiæ at apex and hind metatarsus not strongly compressed and flattened 8

Hind tibiæ at apex and hind metatarsus strongly, foliaceously compressed and flattened ....**Crœsus** p. 121

8. Head with frontal area distinct; thorax shining, smooth, at most sparsely punctate; head triangular when viewed in front 9

Head with frontal area wanting; thorax opaque, with dense, fine punctures; head round when viewed in front ....
Amauronematus p. 121

9. Male with the last ventral abdominal segment obtusely triangularly produced at the apex; saw-guides of female of the usual form ....**Pteronidea** p. 124

Male with the last ventral abdominal segment excavated at the tip, and not obtusely triangularly produced at the apex; saw-guides of female very broad, large, and thickened ....
Nematus p. 120

Diphadnus Hartig.

Key to Species.

1. Pronotum with angles broadly yellow 2

Pronotum with angles black; vertex smooth, shining, frontal crest almost obsolete; third antennal segment longer than fourth; median fovea very minute, circular; saw-guides scarcely projecting, tapering, rather densely clothed with hairs; body shining black, with tegulæ and legs light yellowish; bases of coxæ and anterior femora somewhat infuscated; antennæ pale beneath. Length 5 mm. ....
appendiculatus

2. Clypeus and labrum black; head densely punctate, opaque; clypeus very slightly emarginate beneath and acuminate at tip; body black, with angles of pronotum, tegulæ, trochanters, apices of femora, especially the front pair, tibiæ, and tarsi, yellowish ferruginous; posterior tibiæ and tarsi somewhat infuscated. Length 4.5 mm .... **californicus**

   Clypeus and labrum pale; head and thorax punctate; clypeus squarely truncate; frontal crest rounded, almost wanting; antennal segments three to five subequal; procidentia very broad, obtusely, strongly keeled; body black, with clypeus, labrum, and mouth-parts pallid; angles of pronotum, tegulæ, more or less of apical half of femora, anterior tibiæ and tarsi, and basal two-thirds of tibiæ, yellowish. Length 5.5 mm. .... **proximatus**

D. **appendiculatus** (Hartig). *Pristiphora grossularia* Walsh. *Gymnonychus appendiculatus* Hartig. Larva feeds on gooseberry. New Haven, 21 April, 1896 (W. E. B.); Orange, 13 April, 1911 (B. H. W.).

D. **californicus** (Marlatt). *Gymnonychus californicus* Marlatt. Larva feeds on pear. New Haven (H. L. V.).

*D. **proximatus** (Norton). *Nematus proximatus* Norton. *Gymnonychus proximatus* Norton. Connecticut (E. N.).

Pristiphora Latreille.

Key to Species.

1. Thorax and abdomen black 2

   Thorax or abdomen or both in part pale 3

2. Head small, narrow, and not much more than half the width of thorax; vertex smooth, ridges rounded, sub-obsolete; median fovea minute and circular; third antennal segment longer than fourth; body shining black, with anterior and middle tibiæ and tarsi yellowish; posterior tibiæ with basal two-thirds whitish. Length 5 mm. .... **sycophanta**

   Head nearly as wide as thorax; vertex without ridges and deeply, coarsely punctate; third antennal segment longer than fourth; body shining black, with apex of clypeus, labrum, tegulæ in the female, apices of coxæ, trochanters, and tibiæ in great part, pallid; anterior tarsi somewhat infuscated; apical half of posterior tibiæ and tarsi black. Length 5 mm. .... **banksi**

3. Abdomen entirely black on the dorsum 4

   Abdomen in part pale on the dorsum 6

4. Abdomen with venter pale; vertex without ridges and somewhat roughened with minute tubercles; median fovea shallow or nearly wanting; procidentia broad and strongly keeled; body shining black, with clypeus, mouth-parts, pronotum, tegulæ, legs, and central area of abdomen on venter, pale yellowish; apical half of posterior tibiæ and their tarsi, brownish black. Length 5 mm. .... **carolinensis**

Abdomen with venter black 5

5. Pronotum and tegulæ pale; head and thorax strongly punctate; ocellar and frontal ridges sub-obsolete; median fovea broad and shallow; antennal segments three to five subequal; procidentia broad, slightly excavated at tip, not projecting; hypopygium notched at tip; body black, with clypeus, labrum, bases of mandibles, palpi, legs in great part, pronotum, and tegulæ, yellowish ferruginous; tips of posterior tibiæ and tarsi fuscous. Length 6 mm. .... **luteola**

Pronotum and tegulæ black .... (See sec. 7) **idiota**

6. Body reddish orange marked with black; head densely and finely, tuberculately granulate, opaque, clothed with setæ; ridges of ocellar basin and frontal crest almost wanting; antennal segments three to five subequal; clypeus, labrum, and bases of mandibles inclined to pallid; vertex in great part, antennæ, stripes on lobes of mesonotum, scutellum, metanotum, sides of first abdominal segment, other segments along the middle of dorsum, lower part of pleuræ, and saw-guides, black or dark brown; tips of hind tibiæ and hind tarsi infuscated. Length 6.5 mm. .... **bivittata**

Body black, marked with yellow 7

7. Abdominal segments two to five, usually only on sides, yellow; head with coarse, deep punctures; ridges of ocellar basin rounded, nearly obsolete; third antennal segment much longer than fourth, fourth and fifth segments subequal; saw-guides rather slender, rounded at tip, with a dense bordering fringe of hairs; body shining black, with clypeus, tegulæ, legs, and abdominal segments two to five, usually interrupted at middle, yellow; femora usually brown basally and apically; tips of posterior tibiæ and their tarsi brown or black. Length 5 mm. .... **idiota**

Abdomen with segments one to four entirely reddish yellow; head with dense, coarse punctures; frontal crest slightly elevated; median fovea shallow; third antennal segment longer than fourth; saw-guides not very broad, rounded at apex, with dense bordering hairs; body shining black, with clypeus, outer half of pronotum, tegulæ, abdominal segments one to four, and legs, reddish yellow; apical third of posterior tibiæ and their tarsi black. Length 5.5 mm. .... **dyari**

P. sycophanta Walsh. *Pristiphora tibialis* Norton. Larva feeds on willow, birch, and *Vaccinium*. Connecticut (E. N.).

°**P. banksi** Marlatt.

°**P. carolinensis** Marlatt.

P. luteola (Norton). *Nematus luteolus* Norton. Farmington (E. N.).

°**P. idiota** Norton. *Pristiphora identidem* Norton. Larva feeds on *Vaccinium*.

P. bivittata (Norton). *Nematus bivittatus* Norton. Larva feeds on *Spiræa*. Connecticut (E. N.).

°**P. dyari** Marlatt.

Lygæonematus Konow.

L. erichsoni Hartig. *Nematus erichsoni* Hartig. *Nematus notabilis* Cresson. Larch Sawfly. Howard, Insect Book, Pl. xii, Fig. 16.

Head and thorax finely punctate, entire body shiny; ridges of ocellar basin and frontal crest rounded and distinct; median fovea long, shallow, deepest at apex; antennal segments three and four subequal; saw-guides broad, rounded, truncate at tip; body black, with tip of clypeus, basal two-thirds of tibiæ, apices of trochanters, and angles of pronotum, whitish; femora, tips of anterior tibiæ and their tarsi, and four basal segments of abdomen, orange rufous; male with procidentia strongly keeled, somewhat constricted basally, short, not projecting beyond the seventh dorsal segment, and the hypopygium slightly emarginate at apex. Length 8-11 mm. Larva feeds on European and American larch (*Larix*).

New Canaan, North Canaan, Union, and Woodstock, 1915.

Pachynematus Konow.

Key to Species.

1. Males 15
Females 2
2. Saw-guides large, projecting free for at least one-half of their length 3
Saw-guides normal, projecting but slightly, at least never for one-half of their length.. 4
3. Body black or dark brown; ocellar basin with distinct but not strongly elevated walls; frontal crest not strongly

raised, slightly broken at middle; antennæ with third segment much shorter than fourth; saw-guides long, rounded at apex, blades thin and closely applied; body brownish black, with abdomen lighter, inclined to fulvous; face below antennæ, the upper and posterior orbits, pronotum, tegulæ, and legs except bases of coxæ, reddish yellow, strongly infuscated. Length 8 mm. ....**dimmockii**

Body in great part yellow or resinous; ocellar basin with distinct and broad lateral walls; frontal crest strong and unbroken; antennal segments three and four subequal; saw-guides long and large, broadly rounded at apex, blades thin, translucent, closely applied; body shining resinous yellow, with antennæ, spot on lateral lobes of mesonotum, apex of scutellum, metanotum in part, and narrow border to basal plates, brownish black. Length 8.5 mm ....**ocreatus**

4. Head strongly developed and dilated behind compound eyes 5

Head narrowed more or less behind compound eyes 10

5. Head and mesonotum in great part pale 6

Head black, with orbits black or strongly infuscated; thorax in great part black 9

6. Ocellar basin with strong, distinctly defined sides; frontal crest strong, very minutely notched; median fovea extending laterally over bases of antennæ; saw-guides moderately broad and thick, obliquely truncate, upper edge nearly straight; body resinous or sulphur yellow, with antennæ, a small spot including the ocelli, spot on lobes of mesonotum, spot on either side and base of scutellum, metanotum, tergum of abdomen except narrow lateral margin and two terminal segments, and saw-guides, brownish black. Length 7-8.5 mm ....**extensicornis**

Ocellar basin with its sides and the frontal crest indistinct 7

7. Wings hyaline; median fovea distinct 8

Wings infuscated; median fovea almost wanting; saw-guides narrow and pointed at tip, upper edge straight; body shining honey-yellow, with antennæ, a spot about the ocelli, spot on lobes of mesonotum, apex of scutellum, metanotum, center of basal plates, and bases of first six dorsal abdominal segments, black or fuscous. Length 6.5 mm ....**suadus**

8. Median fovea shallow, and extending widely over bases of antennæ; antennæ with fourth segment as long as or longer than third; saw-guides narrow, tapering, straight on upper margins, obtusely pointed; body luteous, with antennæ, a small spot including the ocelli, a spot on lateral lobes of mesonotum, scutellum in part, metanotum in part, basal plates, disk of tergum, and saw-guides, black; apices

of hind tibiæ and their tarsi, bases of hind coxæ, and a small spot beneath anterior wings, infuscated; stigma, costa, and veins at base, hyaline. Length 6 mm. ....**affinis**

Median fovea circular, not extending over bases of antennæ; antennæ with third and fourth segments subequal; saw-guides straight and oblique above, convex below, convexly rounded at apex to a blunt point above; body luteous, with a spot above the bases of antennæ, around the ocelli, a broad band on median lobe of mesonotum, a narrow band on each lateral lobe, an oblique band at their apices, apex of scutellum, all sometimes rufous, postscutellum, metathorax in part, basal plates, a spot on middle of first abdominal segment, apices of posterior tibiæ, and posterior tarsi, black; stigma luteous, veins brownish. Length 8 mm ....**rufocinctus**

9. Stigma very narrow and acuminate; head and thorax with long, dense pubescence; ocellar basin rather indistinctly defined; frontal crest long and unbroken, median fovea triangular; saw-guides short, tapering, obtusely pointed; body black, with tips of clypeus, mouth-parts, angles of pronotum, tegulæ, tip of abdomen except saw-guides, and outer half of femora, reddish yellow; tibiæ pale yellowish; tarsi infuscated; pleuræ with a reddish mark. Length 8 mm. ....**pubescens**

Stigma broad and rounded beneath; head and thorax with short, inconspicuous pubescence; ocellar basin distinct, with sharp lateral walls; frontal crest not prominent and unbroken; median fovea oval; saw-guides short and tapering; body black, with labrum, angles of pronotum, tegulæ, tip of abdomen, venter in great part, and legs, yellowish or reddish; bases of coxæ and of femora infuscated. Length 8 mm. ....**montivagus**

10. Tergum of abdomen reddish yellow; head and thorax strongly punctate; ocellar basin with prominent, elevated ridges; frontal crest prominent and unbroken; saw-guides broad and truncate; body black, with posterior orbits, and notum in part including the scutellum, reddish; supraclypeal area, tip of clypeus, labrum, pronotum, tegulæ, legs, and abdomen, reddish yellow; tips of posterior tibiæ and posterior tarsi infuscated. Length 6.5 mm ....**punctulatus**

Tergum of abdomen black or brown 11

11. Femora entirely pale 12

Femora wholly, or at least some of them in part, black 13

12. Head and thorax black; body black, with clypeus, labrum, collar, tegulæ, legs beyond coxæ except apex of posterior tibiæ and posterior tarsi for the most part, and venter of the abdomen, white or luteous; head distinctly punctate; cly-

peus deeply and narrowly emarginate; frontal crest unbroken; third and fourth segments of antennæ subequal; saw-guides oblique above and below and obliquely truncated at apex. Length 7 mm .... **corticosus**

Head and thorax dark brown; body black, with head, antennæ, pronotum, mesonotum, and dorsum of abdomen more or less, upper half of pleura, and saw-guides, dark brown; clypeus broadly and shallowly emarginate; frontal crest unbroken; antennæ with third segment longer than fourth; saw-guides short, obliquely truncate, pointed at tip. Length 4.3 mm. .... **gregarius**

13. Anterior pair of legs entirely pale; vertex finely tuberculate; ocellar basin with lateral walls minutely but sharply raised, obsolete posteriorly; frontal crest acutely elevated, angulated, and extending nearly to inner orbits; median fovea broad, extending on each side over bases of antennæ; saw-guides broad, straight on upper margins, obliquely truncated at apex, bordering hairs minute and scattering; body shining black, with apex of clypeus, mouth-parts, pronotum in great part, tegulæ, anterior pair of legs, posterior pair of legs except bases of coxæ and apices of femora and tibiæ and all of tarsi, venter of abdomen except at apex, lateral margin and more or less of apex of tergum, yellowish white. Length 6-7 mm..... **corniger**

Anterior pair of legs more or less marked with black 14

14. Frontal crest strongly developed, slightly broken at center, and not reaching inner orbits; ocellar basin with distinct sides but not strongly elevated; median fovea distinct, broadening posteriorly into a suture beneath the frontal crest; saw-guides rather broad, rounded, truncate at apex, straight on upper margins; body black, with tip of the clypeus, labrum, angles of pronotum, tegulæ, coxæ except at base, trochanters, bases of femora and tips of anterior femora, tibiæ except tips of posterior pair, anterior tarsi, and venter except laterally at base and apex, pallid. Length 8 mm. .... **subalbatus**

Frontal crest distinctly elevated and unbroken, extending nearly to the inner orbits; ocellar basin with sides rounded, not strongly raised, and indistinct; median fovea large, circular, deeply excavated; saw-guides rather slender, somewhat pointed at tip, dorsal margin nearly straight; body black, with labrum, bases of mandibles, angles of pronotum, tegulæ, coxæ except at base, trochanters, tibiæ of anterior pair of legs and their tarsi, and venter of abdomen, yellowish or pallid. Length 6 mm. .... **palliventris**

15. Head strongly dilated behind the compound eyes 16

Head not strongly dilated behind the compound eyes 22

16. Body black on dorsum and venter 17

Body black, with venter and more or less of dorsum pale .. 21

17. Head and thorax covered with long, dense pubescence; stigma narrow and acuminate; procidentia wide, tapering, truncate at tip. Length 8 mm. ....**pubescens**

Head and thorax not covered with long, dense pubescence; stigma broad and tapering 18

18. Legs pale beyond apices of femora 20

Legs pale beyond bases of femora 19

19. Procidentia longer than broad, truncate at apex; head with ocellar basin and frontal crest distinct but not strongly raised; body shining black, with supraclypeal area, labrum, apex of abdomen above, hypopygium, more or less of venter on each side, apices of coxæ, trochanters, femora except bases, and tibiæ except apices, light fulvous. Length 5.5 mm. ......**tritici**

Procidentia broader than long, broadly rounded; ocellar basin distinct, sharply raised; body black, with supraclypeal area, labrum, apices of segments of tergum, venter, a spot on pleuræ, and legs, except apices of posterior tibiæ and their tarsi, fulvous. Length 7 mm. ....**rufocinctus**

20. Mouth-parts and orbits black; procidentia very broad, slightly tapering and rounded at tip ....**extensicornis**

Mouth-parts and orbits pale; procidentia projecting only about half its width, broadly truncate at apex ....**affinis**

21. Procidentia narrow, tapering, pointed at top; body resinous yellow, with antennæ, large spot on vertex about ocelli extending onto occiput, thorax above except pronotum and tegulæ, and central dorsal area of abdomen, brownish black. Length 4 mm. ....**gregarius**

Procidentia very broad, tapering, squarely truncate at apex, not keeled; vertex rugose; ocellar basin with indistinct walls, median fovea extending laterally over bases of antennæ, indistinctly defined; body black, with labrum, upper and posterior orbits, angles of pronotum, tegulæ, outer two-thirds of femora, tibiæ, tarsi, and abdomen except base of first dorsal segment, yellowish ferruginous; wings smoky, especially centrally. Length 8 mm. ....**infumatus**

22. Procidentia rounded at apex, not constricted basally, strongly keeled; body black, with tip of clypeus, mouth-parts, angles of pronotum, tegulæ, pectus, venter of abdomen, and legs except bases of coxæ and apices of posterior tibiæ and tarsi, yellowish ferruginous. Length 5 mm. ....**corniger**

Procidentia short, narrow, truncate; body black, with tip of clypeus, mouth-parts, angles of pronotum, venter, and legs except bases of coxæ, extreme tip of posterior tibiæ, and all posterior tarsi, yellowish ferruginous. Length 6.5 mm. ....**subalbatus**

°P. **dimmockii** (Cresson). *Nematus dimmockii* Cresson.

°P. **ocreatus** (Harrington). *Nematus ocreatus* Harrington.

P. **extensicornis** (Norton). *Nematus extensicornis* Norton. *Nematus marylandicus* Norton. *Nematus aureopectus* Norton. Howard, Insect Book, p. 75, Fig. 46, Pl. xiv, Fig. 29. Larva feeds on wheat. New Haven, 15 May, 1911, Orange, 21 May, 1911 (A. B. C.).

P. **affinis** Marlatt. Larva feeds on grass. Stonington, 16 May, 1906 (B. H. W.).

*P. **rufocinctus** MacGillivray. New Haven, 15 May, 1911, Orange, 21 May, 1911 (A. B. C.).

°P. **suadus** (Cresson). *Nematus suadus* Cresson.

°P. **pubescens** Marlatt. Larva feeds on *Carex*.

°P. **montivagus** Marlatt.

°P. **punctulatus** Marlatt.

°P. **corticosus** MacGillivray.

°P. **gregarius** Marlatt. Larva feeds on willow.

*P. **corniger** (Norton). *Nematus corniger* Norton. Larva feeds on grass. Connecticut (E. N.); Branford, 8 May, 1905 (H. W. W.).

P. **subalbatus** (Norton). *Nematus subalbatus* Norton. Orange, 21 May, 1911 (A. B. C.); New Haven, 30 May, 1911 (B. H. W.).

°P. **palliventris** (Cresson). *Nematus palliventris* Cresson.

°P. **tritici** Marlatt. Larva feeds on wheat.

°P. **infumatus** Marlatt.

Nematus Jurine.

Key to Species.

1. Abdomen with last dorsal arc enormously developed; clypeus deeply, rather narrowly notched, lobes large and rounded; ocellar basin scarcely defined, deep furrow connecting anterior ocellus with median fovea; saw-guides tapering, pointed, and with the terminal abdominal segment enormously developed, representing nearly half of abdomen; body uniformly reddish yellow. Length 7 mm. ......**unicolor**

Abdomen with last dorsal arc not enormously developed **2**

2. Ocellar basin with indistinct lateral walls and without tubercles; clypeus nearly truncate; frontal crest large and rounded; saw-guides thick, short, scarcely projecting, margined with long, not very numerous curved hairs; body yellowish ferruginous, with antennæ, spot on either side of scutellum, metathorax in part, basal plates, and center of abdomen above, black; mesonotum, pleuræ in part, margin of abdomen, and sheath, more or less reddish. Length 5 mm. **chloreus**

Ocellar basin with distinct lateral walls and containing two small tubercles; clypeus broadly emarginate; frontal crest large, obtusely rounded; saw-guides thick, squarely truncate, tubular; body luteous, pallid or reddish yellow, with the sides of the mesonotum, most of the metanotum, and a broad stripe on the middle of the abdomen, black. Length 7 mm. .... **pergandei**

°**N. unicolor** Marlatt. Larva feeds on birch.

***N. chloreus** Norton. Larva feeds on *Quercus coccinea.* Connecticut (E. N.).

°**N. pergandei** Marlatt.

Crœsus Leach.

C. latitarsus Norton. Pl. 1, Fig. 1.

Mesothorax with confluent longitudinal punctures; body blue-black, with the labrum, mandibles, palpi and the anterior pair of legs toward the tip, piceous; posterior trochanters and the basal half of all the tibiæ white; wings hyaline, with a smoky area beneath the stigma. Length 8 mm. Larva feeds on birch.

New Haven, 1910 (B. H. W.); Stafford, 24 August, 1906 (W. E. B.). Common in New Haven.

°**C. laticulus** Norton.

Mesothorax with scattered, sub-obsolete, oval punctures; body black, with tegulæ, and a spot on the sides of the basal plates and of the second and third abdominal segments, whitish; mandibles at apex, and legs, ferruginous, with apical two-thirds of their tibiæ and greater part of metatarsi black; wings hyaline. Length 12 mm.

Amauronematus Konow.

Key to Species.

1. Body black on dorsum 2
   Body pale on dorsum, marked more or less with black 9

2. Wings smoky 3
   Wings hyaline 6
3. Legs entirely black 4
   Legs with tibiæ yellowish, at least anterior pair in front 5
4. Abdomen with venter pale; clypeus almost truncate at apex; frontal crest and sides of ocellar basin nearly obsolete, indistinct; median fovea small, elongate; antennæ with third segment shorter than fourth; procidentia very minute and squarely truncate or broadly excavated at apex; body black, with clypeus, labrum, cheeks, and bases of mandibles, whitish; orbits tinged with rufous. Length 6.5-7 mm. .... **concolor**
   Abdomen with venter yellowish white; clypeus very shallowly emarginate; ocellar basin with rounded, indistinct walls, frontal crest almost wanting; median fovea shallow, elongate; antennal segments three to five subequal, the fourth longest; saw-guides obliquely truncate at apex; body black, with the oral region, outer orbits, supraclypeal area, pronotum in great part, and venter of abdomen, yellowish white. Length 9 mm. .... **comstockii**
5. Clypeus rather broadly and shallowly emarginate; orbits pale; ocellar basin with distinctly defined walls; frontal crest narrow, not extending on each side, slightly broken by the deeply excavated, elongate median fovea; antennæ with third segment shorter than fourth; saw-guides somewhat elongate, rounded at apex; body brownish black, with supraclypeal area, orbits, oral region, angles of pronotum, more or less of apical ventral segments, joints of legs, and most of anterior tibiæ, yellowish. Length 8 mm. .... **gracilis**
   Clypeus narrowly and rather deeply emarginate; orbits not pale; ocellar basin with its lateral walls rounded; frontal crest deeply broken by backward extension of deep, elongate median fovea; antennæ with third segment shorter than either fourth or fifth; saw-guides elongate, slightly tapering, rounded at tip; body black, with supraclypeal area, clypeus, labrum, cheeks, base of mandibles, and angles of pronotum, yellowish white; anterior legs in front from middle of femora, yellowish infuscated; venter of abdomen, except apex, yellowish. Length 9 mm. ...... **similis**
6. Abdomen black on venter 7
   Abdomen pale on venter 8
7. Legs black except at joints; clypeus moderately and rather narrowly emarginate; ocellar basin with side walls rounded and indistinct; frontal crest not extending laterally, slightly broken by the shallow median fovea; procidentia short, squarely truncate, with sharp angles, keeled; body black,

with clypeus, oral region, and beneath the eyes, whitish; joints of legs, more or less of anterior face of tibiæ and apices of femora, and angles of pronotum, yellowish. Length 5 mm. .... **cooki**

Legs reddish except apical half of posterior tibiæ; clypeus broadly emarginate; ocellar basin distinctly defined but not deeply excavated; frontal crest not strongly developed; median fovea triangular; procidentia short, more than twice as broad as long, truncate; body entirely black except parts named. Length 9 mm. .... **rufipes**

8. Frontal crest strongly raised and unbroken; clypeus broadly and shallowly emarginate; ocellar basin with distinctly defined but not prominent walls; median fovea shallow, elongate oval; saw-guides pointed, with a distinct scopa near the tip; body in female dull black, with face below antennæ, orbits, pronotum, tegulæ, pectus broadly, venter of abdomen, lateral edge of dorsum, and some of the margins of the basal segments of the abdomen, pallid; legs in part slightly infuscated; male differs in having dorsum of abdomen black and venter somewhat infuscated. Length 5.5 mm. ...... **azaleæ**

Frontal crest broken .... (See sec. 5) **similis**

9. Abdomen black on dorsum; ocellar basin with side walls indistinct or wanting; frontal crest short, strongly raised, and scarcely broken; median fovea small, shallow, circular; saw-guides very broad, obliquely truncate, upper edge obtusely pointed; body luteous or reddish, with a spot on vertex extending to antennæ, lobes of mesonotum at center, scutellum in part, metanotum, abdomen on dorsum, saw-guides, and lower half of pleuræ, black. Length 6 mm. .... **fulvipes**

Abdomen yellow 10

10. Wings smoky; legs black; frontal crest and sides of ocellar basin indistinct; median fovea elongate, shallow; saw-guides elongate, obtusely rounded at apex; body yellowish ferruginous, with the head and thorax in great part, center of the basal plates, apex of the abdomen, saw-guides, and legs, black. Length 8.5 mm. .... **luteotergum**

Wings hyaline or nearly so; legs pale 11

11. Femora wholly or in part black; ocellar basin with indistinct walls; frontal crest large, sharply defined, slightly or not at all broken; median fovea triangular; saw-guides long, narrow, regularly and equally rounded on both margins to obtuse apex; body ferruginous or reddish, with antennæ above, a line on anterior lobes of mesonotum, sometimes wanting, apex of scutellum, metanotum in great part, and abdomen dorsally at center, black. Length 7.5 mm. .. **lineatus**

Femora resinous or yellow 12

12. Frontal crest slightly broken; ocellar basin with rounded walls; median fovea elongate; saw-guides tapering on both edges, somewhat angularly, to an obtuse tip, smooth, margined with very short, scattering hairs; body light yellowish or reddish, with the antennæ above black; tips of hind tibiæ and their tarsi infuscated. Length 7 mm. ....**brunneus**

Frontal crest distinct and unbroken; ocellar basin with wide, rounded walls; median fovea circular, with branches extending over bases of antennæ; saw-guides tapering, obtusely pointed, clothed with short and rather dense hairs; body resinous yellow, thorax and head reddish; antennæ, ring about ocelli, and postscutellum black. Length 6 mm. **dyari**

***A. concolor** (Norton). *Nematus concolor* Norton. *Nematus violaceipennis* Norton. Farmington (E. N.).

°**A. comstocki** Marlatt.

°**A. gracilis** Marlatt.

°**A. similis** Marlatt. Larva feeds on willow.

°**A. cooki** Marlatt.

°**A. rufipes** Marlatt.

°**A. azaleæ** Marlatt. Larva feeds on *Azalea*.

A. fulvipes (Norton). *Nematus fulvipes* Norton. Connecticut (E. N.).

A. luteotergum (Norton). *Nematus luteotergum* Norton. Larva feeds on alder. Connecticut (E. N.).

°**A. lineatus** (Harrington). *Nematus lineatus* Harrington.

°**A. brunneus** (Norton.) *Nematus brunneus* Norton.

°**A. dyari** Marlatt. Larva feeds on poplar.

Pteronidea Rohwer.

Key to Species.

1.	Females	2
	Males	34
2.	Dorsum of body black with pale markings	3
	Dorsum of body pale with black markings	31
3.	Pectus always black	4
	Pectus usually entirely pale, rarely in part fuscous	20
4.	Stigma narrow, more than three times as long as wide, usually straight on lower margin	5
	Stigma broad, not much more than twice as long as wide, rounded on lower margin	7

5. Head, thorax, and abdomen black above; ocellar basin well-defined; frontal crest slightly notched at center; antennal segments three and four subequal; saw-guides broadly rounded on lower margin, pointed at tip; body black, with the area above bases of antennæ, postgenæ, orbits, mouth-parts, pronotum, tegulæ, legs in great part, and venter of abdomen, pale; remainder of legs, veins, and stigma brown. Length 8 mm. .... **lata**

Head and thorax black, abdomen more or less pale.......... 6

6. Abdomen with broad, lateral, pale stripe; sides of ocellar basin strongly and sharply raised; median fovea small, indistinct; frontal crest very prominent, broadly curved, unbroken; saw-guides short, broad, obtusely pointed; body black, with clypeus and mouth-parts, most of pronotum, tegulæ, lateral third of dorsum of abdomen, all of venter of abdomen, and legs, yellowish ferruginous; upper orbits and sides of mesonotum tinged with reddish. Length 7 mm. **limbata**

Abdomen with a broad, transverse, yellow band; sides of ocellar basin and frontal crest strongly raised; median fovea large, oval, deeply excavated; antennal segments three and four subequal; saw-guides moderately robust, obtusely pointed, with straight upper margins; body black, with tip of clypeus, labrum, bases of mandibles, palpi, and basal half of hind tibiæ, whitish; upper margin of pronotum, tegulæ, dorsum of four basal abdominal segments except apex of fourth, all of venter, and legs, yellowish ferruginous. Length 8 mm. .... **latifasciata**

7. Head and thorax black 8

Head and thorax in great part pale 19

8. Abdomen with venter pale, dorsum always more or less black, except sometimes the apical segments 9

Abdomen with venter and dorsum pale, except sometimes the basal dorsal segments and rarely the terminal segments 12

9. Femora all black; ocellar basin well defined; frontal crest large, indistinctly broken; antennæ with third segment slightly longer than fourth; saw-guides pointed, slightly excavated above and rounded beneath; body brownish black, with inner and outer orbits, face below base of antennæ, pronotum except two or three dusky spots, tegulæ, front femora, sometimes almost entirely, tips of femora and tibiæ, lateral edges of thorax and abdomen, and venter, yellowish white. Length 8 mm. .... **ventralis**

Femora wholly or in part pale 10

10. Femora of front and middle legs pale, of hind legs black; ocellar basin deep with well-defined walls; frontal crest unbroken; median fovea large, triangular, deeply exca-

vated; antennal segments three and four subequal; saw-guides broad, obtusely pointed, upper margin slightly emarginate; body black, with the face below the antennæ, mouth-parts, orbits, angles of pronotum narrowly, tegulæ, narrow apical margin of dorsal segments, two apical dorsal segments, venter except epimera and some dusky spots on lateral margin of abdomen, and legs except apical half of posterior femora and apices of tibiæ and tarsi, yellowish. Length 5.5 mm. .... **marlattii**

Femora of all the legs pale................................ 11

11. Hind wings with free part of R_4 and transverse part of M_2 interstitial; ocellar basin distinctly defined; frontal crest strong, unbroken; median fovea deep, with lateral channels running from it over bases of antennæ; antennal segments three and four nearly equal; body black, with tip of clypeus, mouth-parts, angles of pronotum, tegulæ, legs in great part, venter of abdomen, and marginal third of dorsum of abdomen, yellowish. Length 7 mm. ......**harringtoni**

Hind wings with transverse part of M_2 separating from R a considerable distance before free part of R_4; ocellar basin with well defined walls; frontal crest unbroken; median fovea oval; antennal segments three and four sub-equal; saw-guides broad, tapering, slightly produced, with a rather dense tuft of short hairs at the extreme tip; body black, with supraclypeal area, clypeus in great part, mouth-parts, tegulæ, abdomen except broad dorsal stripe, and legs in great part, reddish yellow. Length 7 mm. ....**fylesi**

12. Hind femora black, at least apically 13

Hind femora entirely pale 17

13. Head with orbits pale; ocellar basin with sharply defined walls; frontal crest distinct, unbroken; median fovea circular; saw-guides smooth, polished, pointed, bordering hairs minute; body black, with clypeus, mouth-parts, angles of pronotum, tegulæ, anterior and posterior legs (except apical three-fourths of hind femora, hind tibiæ, and tarsi), yellowish white; central part of mesonotum and scutellum sometimes yellowish brown; apical two-thirds of abdomen ferruginous; hind tibiæ entirely brown, pale at base, and gradually darker towards apex, or white at base and gradually shading to brown. Length 7 mm. ....**tricolor**

Head with orbits black 14

14. Abdomen with apical segments black 15

Abdomen with apical segments rufous 16

15. Antennal segments three and four subequal; median fovea distinctly defined, oval; ocellar basin with sharply defined and strongly raised walls; frontal crest prominent, sharp, unbroken; saw-guides short, obtusely pointed, quite

densely clothed with hairs; body black, with the center of the basal abdominal segment, the three following segments and part of the fourth, reddish yellow; tip of clypeus, mouth-parts, anterior legs in great part, coxæ except at base, trochanters, bases of femora, and basal half of tibiæ of hind legs, pallid; pronotum and tegulæ pallid, infuscated. Length 8 mm. **rufocincta**

Antennæ with third segment longer than fourth; median fovea very shallow, indistinct; ocellar basin well-defined, with prominent anterior angle; saw-guides short, stout, scarcely projecting; body black, with angles of pronotum, tegulæ, and abdominal segments one to five dorsally and ventrally, yellowish ferruginous; mouth-parts strongly infuscated; coxæ except at base, trochanters, and basal half of posterior tibiæ, whitish; anterior and posterior faces of anterior tibiæ and tarsi pallid. Length 6 mm. .... **dyari**

16. Head and thorax finely punctate; clypeus shallowly and broadly emarginate, lobes triangular and rather pointed; median fovea circular, deeply excavated; frontal crest and sides of ocellar basin strongly raised, frontal crest unbroken; saw-guides rather robust, rugose, with numerous hairs; body black, with tip of clypeus, labrum, palpi, angles of pronotum, tegulæ, abdomen except basal plates, first segment on dorsum, saw-guides, and legs (except bases of coxæ, tips of hind femora, apical two-thirds of hind tibiæ, and hind tarsi), rufous; basal third of hind tibiæ, white. Length 7.5 mm. .... **erythrogastra**

Head and thorax rather coarsely punctate, somewhat shiny; clypeus very shallowly emarginate, lobes very short and broadly rounded; median fovea broad and shallow; frontal crest and sides of ocellar basin distinctly elevated; frontal crest rarely indistinctly broken; saw-guides not very robust, rounded at apex, and with rather long and dense hairs; body black, with bases of antennæ, tip of clypeus, labrum, palpi, angles of pronotum, tegulæ, legs (except apex of posterior femora, apical half of posterior tibiæ, and hind tarsi), and abdomen except basal plates, yellowish ferruginous. Length 6-7 mm. .... **corylus**

17. Angles of pronotum and coxæ black; walls of ocellar basin distinctly defined; frontal crest prominent, unbroken; median fovea shallow; saw-guides robust, obtusely pointed, straight on the upper margins; body black, with labrum pallid; tips of anterior femora, hind femora, and abdomen except apical segment, orange-yellow, inclined to reddish on legs; wings smoky. Length 8.5 mm. .... **fulvicrus**

Angles of pronotum and the coxæ pale.................... 18

18. Mesonotum with lateral lobes black, spotted with ferruginous; first abdominal segment black at base, ferruginous at apex; sides of ocellar basin distinctly raised; frontal crest prominent and unbroken; median fovea broad, shallow, not distinctly defined; saw-guides rather broad, slightly excavated above, pointed, and with rather dense whitish hairs at tip; body black, with tip of clypeus, labrum, posterior orbits, angles of pronotum, tegulæ, spot on the lateral lobes of mesonotum, abdomen beyond the middle of the first segment, and legs except the bases of the coxæ and the hind tibiæ and tarsi, yellowish ferruginous. Length 7 mm. .... **populi**

Mesonotum with the lateral lobes entirely and the entire first abdominal segment ferruginous; ocellar basin distinctly defined; frontal crest very prominent, unbroken; median fovea distinctly excavated, triangular; saw-guides narrow and tapering; body black, with clypeus and labrum pale; angles of pronotum, tegulæ, lateral lobes of mesonotum, abdomen except the basal plates and saw-guides, and legs except hind tibiæ and tarsi, yellowish ferruginous. Length 10 mm. .... **hudsonii**

19. Hind femora mostly black; ocellar basin distinct, with sharply raised sides; frontal crest broad, rounded, unbroken; median fovea deep, circular; saw-guides strongly tapering toward the rounded apex, nearly straight on upper margins, with very short, inconspicuous pubescence; body yellowish or ferruginous, with base of antennæ, spot about ocelli, occiput, pronotum except outer angles, spot on lobes of mesonotum, spot about the cenchri, basal plates, and first abdominal segment at base, black; pectus, hind femora except at base, tips of hind tibiæ, and hind tarsi, blackish brown. Length 6 mm. .... **antennata**

Hind femora entirely pale; ocellar basin with poorly defined walls; frontal crest entire or indistinctly broken; median fovea rather deep at apex, oval; saw-guides rather narrow, rounded at extremity, with short hairs; body luteous or ferruginous, with head below antennæ, except the supraclypeal area, orbits, more or less of antennæ above, large spot on middle of lobes of mesonotum, scutellum more or less, lower part of pleuræ, pectus, apices of posterior tibiæ, and posterior tarsi, brownish black. Length 7-7.5 mm. **ribesii**

20. Head with the orbits not pale 21

Head with orbits pale.................................. 23

21. Mesonotum black; ocellar basin distinctly defined, with prominent walls; frontal crest strongly bent anteriorly, scarcely broken centrally; median fovea triangular, deep, with sharp limiting ridges; saw-guides short, rounded

at tip, slightly emarginate beneath, clothed with dark brownish hairs; body black, with supraclypeal area, clypeus, mouth-parts, pronotum, tegulæ, pectus in great part, legs except apices of hind femora and tibiæ and hind tarsi, and venter of abdomen, light resinous yellow; abdomen at sides, and central area interrupted at base and apex, yellow. Length 6 mm. .... **carpini**

Mesonotum, at least in part, pale 22

22. Median lobes of mesonotum in great part, and abdomen, black; frontal crest prominent, sometimes slightly broken; median fovea shallow, indistinct; saw-guides obtusely pointed, straight on upper edge, narrow; body ferruginous, with head except palpi and clypeus sometimes in part, margin of the pronotum, a band along middle of mesonotum, metanotum, metapleuræ, basal plates, abdomen above, apices of posterior tibiæ, and posterior tarsi, black. Length 7 mm. .... **militaris**

Median lobes of mesonotum and abdomen in great part reddish; ocellar basin with rounded walls; frontal crest unbroken; median fovea shallow, circular; saw-guides rather short and robust, regularly rounded at tip; body reddish yellow, with antennæ, head except tip of clypeus and more or less of mouth-parts, scutellum more or less, metanotum, center of basal dorsal area of abdomen, and saw-guides, black. Length 6 mm. .... **thoracica**

23. Stigma and costa brown 24

Stigma and costa yellowish hyaline 28

24. Scutellum black 25

Scutellum pale 27

25. Frontal crest unbroken; ocellar basin with distinctly limiting walls; median fovea deep and triangular; saw-guides short, rather robust, regularly tapering; body light greenish yellow, with antennæ, large spot about the ocelli extending onto the occiput, lobes of mesonotum, metanotum, large spot on upper angles of pleuræ, base of dorsal abdominal segments centrally, apex of saw-guides, apex of hind femora, apical two-thirds of hind tibiæ, and hind tarsi, black. Length 6 mm. .... **ostryæ**

Frontal crest broad, slightly broken at middle 26

26. Head nearly spherical when viewed laterally; clypeus rather narrowly and deeply emarginate; ocellar basin distinctly defined, sides acute, finely raised; frontal crest broad, somewhat broken at middle; median fovea broad, circular, shallow; saw-guides narrow, rounded at apex; body pallid or resinous, with antennæ, spot on vertex, including the ocelli and extending onto the occiput, mesonotum, metanotum,

abdomen on dorsum except narrow lateral margin, and apex of saw-guides, black; scutellum at base, and suture of mesonotum, inclined to reddish. Length 5.5 mm. ....**odorata**

Head triangular in outline when viewed laterally; clypeus broadly, circularly emarginate, lobes rounded, not broad; ocellar basin deeply and distinctly excavated, lateral walls rounded; frontal crest strongly developed, divided by a narrow depressed line at middle; median fovea deep; saw-guides narrow, tapering to a rounded tip; body pallid or resinous, with antennæ, large spot covering vertex, dorsum of thorax, and abdomen except narrow lateral margin, black; hind tarsi and saw-guides brown; hind tibiæ darker at tip. Length 7 mm. ....**cornelli**

27. Posterior tibiæ and tarsi dark brown; ocellar basin with distinctly defined sides; frontal crest distinct, unbroken, curving anteriorly; median fovea triangular, sharply defined; saw-guides narrow, smooth, tapering on both edges to rounded tip; body reddish yellow, with antennæ, large spot on vertex extending onto occiput, mesonotum, small spot beneath anterior wings, metanotum except postscutellum and sutures and lateral margin, abdomen except lateral margin and apical segment, apical half of saw-guides, and posterior tibiæ and tarsi, brownish black. Length 6.5-7 mm. ....**trilineata**

Posterior tibiæ and tarsi resinous; ocellar basin distinctly defined, sides faintly raised; frontal crest stout; median fovea elongate, rather deeply excavated; saw-guides broad, obtusely pointed, densely hairy at apex and on lower margin; body yellow ferruginous, with the antennæ basally, spot on the head surrounding the ocelli and extending narrowly over the vertex, large spot on anterior lobe of mesonotum, apex of scutellum, metanotum, and abdomen on dorsum except narrow lateral margin and more or less of some of the middle segments at apex, black. Length 8 mm. ....**magna**

28. Frontal crest broad, unbroken at middle.................. 29

Frontal crest broad, broken at middle...................... 30

29. Antennæ with third segment longer than fourth; saw-guides robust, densely clothed with long, whitish hairs at apex on lower margin; clypeus nearly truncate; ocellar basin indistinctly defined, sides rounded; frontal crest broad, unbroken; median fovea defined only on anterior margin; body yellowish or ferruginous, with a spot on the vertex extending back over the occiput, mesonotum, metanotum, and dorsum of abdomen except a narrow lateral margin, black. Length 4.5 mm. ....**quercus**

Antennæ with third segment shorter than fourth; saw-guides narrow, tapering to a rounded tip; clypeus very broadly but not deeply emarginate; ocellar basin with distinctly defined walls; frontal crest prominent but not distinctly limited; body yellowish or pallid, with antennæ, a large spot on the vertex, mesonotum, metanotum, and dorsum of abdomen, black. Length 7 mm. ....**hyalina**

30. Scutellum wholly or in part black; saw-guides rather pointed, lower margin regularly pointed, upper margin straight or slightly concave, bordering hairs very minute; clypeus distinctly but not very broadly emarginate; ocellar basin with sides distinctly, rather sharply raised; frontal crest rounded, broken at middle; median fovea circular, shallow; body light yellowish, with antennæ, a spot on vertex extending onto occiput, lobes of mesonotum except lateral edges, metanotum, and dorsum of abdomen centrally except apex of last segment, black or dark brown; hind tibiæ and tarsi more or less infuscated. Length 6 mm. **vertebrata**

Scutellum pale; saw-guides rather narrow, slightly concave above, rounded at apex; clypeus circularly emarginate; ocellar basin distinctly limited; frontal crest large, slightly broken at middle; median fovea expanding basally; body pallid or yellowish, with antennæ above, spot on vertex extending to bases of antennæ, center of lobes of mesonotum, metanotum, and central portion of abdomen on dorsum, brownish black; tibiæ and tarsi slightly infuscated. Length 6-6.5 mm. ....**integra**

31. Body entirely without black or brownish markings of any sort. Length 7 mm. ....**monochroma**

Body, at least in part, with black or brownish markings 32

32. Body greenish luteous, with first seven dorsal abdominal segments, saw-guides, mesothorax in part, metathorax, spot on pleuræ below wings, and two basal segments of antennæ, black; clypeus hardly emarginate; tips of tarsi blackish; stigma and costa pale green. Length 7 mm. ....**stigmata**

Body yellow or pallid, without black or brownish band on dorsum of abdomen 33

33. Frontal crest prominent, broken at middle, or strongly bituberculate; median fovea broad, shallow; clypeus broadly but not deeply notched; ocellar basin with distinctly defined but rounded lateral walls; saw-guides tapering, straight or slightly concave on upper margin; body light yellowish, with narrow border to ocelli, small spot on occiput, spots on lobes of mesonotum, sometimes wanting, apex of scutellum, and spot between cenchri, brownish black; costa and stigma greenish hyaline. Length 5-6 mm. **mendica**

Frontal crest unbroken; median fovea deep, extending laterally over bases of antennæ; clypeus deeply, circularly emarginate; ocellar basin distinctly defined, lateral walls not very sharply raised; saw-guides robust, obliquely truncate at tip; body light yellow or pallid, with spot connecting ocelli, antennæ above, and anterior edge of cenchri, dark brown or black; lobes of mesonotum and head above, brownish purple; stigma yellow. Length 8 mm. **pinguidorsum**

34. Procidentia very broad and large.......................... 35

Procidentia narrow, sometimes almost obsolete............. 36

35. Head including orbits black; clypeus shallowly and broadly emarginate; sides of ocellar basin and frontal area rounded, indistinct; procidentia very broad, one-third as wide as last segment, rounded at tip, strongly constricted basally; body black, with clypeus, mouth-parts, angles of pronotum, tegulæ, narrow lateral margin of abdomen, posterior margin of central segments, two terminal segments, venter of abdomen, and legs, yellowish ferruginous; apices of posterior tibiæ and their tarsi black. Length 6-7 mm......**longicornis**

Head with orbits reddish; procidentia very broad, as broad as long, constricted at base; body black or brownish, with mouth-parts, pronotum, tegulæ, base of costa, legs except tips of posterior tibiæ and their tarsi, abdomen beneath, and more or less of the sides of the tergum, luteous; orbits, lateral lobes of mesonotum, and basal edges of scutellum, more or less rufous. Length 6 mm. ....**ribesi**

36. Pectus black 37

Pectus and venter of abdomen pale......................... 43

37. Abdomen with the venter black............................ 38

Abdomen with the venter pale.............................. 42

38. Legs pale except tips of posterior tibiæ and their tarsi...... 39

Legs entirely pale; clypeus broadly emarginate, almost truncate; frontal crest very large, strongly angled anteriorly; ocellar basin with lateral walls tapering rapidly posteriorly; median fovea narrow, breaking slightly through the frontal crest; third antennal segment slightly shorter than fourth or fifth; procidentia short, not very broad, rounded at apex; body black, with clypeus, mouth-parts, extending to eyes, narrow line on venter of abdomen including hypopygium, and legs, ferruginous yellow; coxæ black at base. Length 5.5 mm...................... ....**dubia**

39. Clypeus distinctly emarginate; procidentia minute 40

Clypeus nearly truncate; procidentia long and projecting, keeled; body colored as in female, except that the abdomen is wholly black, and the legs yellowish except tip of posterior femora and apical half of posterior tibiæ. Length 5.5 mm. **dyari**

40. Stigma rather elongate and acuminate; extreme tips of hind tibiæ brown 41

Stigma short and robust; apical half of hind tibiæ infuscated; clypeus shallowly but distinctly emarginate; ridges around ocellar basin rounded but distinct; procidentia narrow, short, and blunt; body black, with clypeus, labrum, palpi, tegulæ, and legs except coxæ and posterior tibiæ and tarsi, yellowish ferruginous. Length 5.5 mm. ....**lombardæ**

41. Abdomen with venter black; hind wings with free part of R_4 and transverse part of M_3 interstitial; procidentia short, narrow, slightly constricted basally, truncate at apex; other characters as in female. Length 6 mm. ....**harringtoni**

Abdomen with venter pale; hind wings with free part of R_4 and the transverse part of M_3 not interstitial; procidentia short, narrow, truncate at apex; other characters as in female except that dorsum of abdomen is entirely black and venter infuscated. Length 6 mm. ....**fylesi**

42. Abdomen entirely black on dorsum; upper half of pleuræ pale; procidentia apparently nearly wanting; other characters as in female. Length 4.5 mm. ....**thoracica**

Abdomen with a transverse reddish band on segments two and three of dorsum and venter; procidentia as long as broad, narrow, tapering, squarely truncate, or slightly emarginate at apex, constricted at base; other characters as in female, except that inner orbits are black, legs dark reddish yellow, bases of all dorsal abdominal segments dark, especially the terminal ones, and hind tibiæ slightly infuscated. Length 7 mm. ....**ventralis**

43. Stigma and costa brown.................................. 44

Stigma and costa yellowish hyaline......................... 45

44. Head nearly spherical in outline when viewed laterally; clypeus narrowly and deeply excavated; procidentia short, narrow, rounded at apex. Length 5 mm. ....**odorata**

Head triangular in outline when viewed laterally; clypeus rather broadly excavated; procidentia short, narrow, projecting about its own width. Length 5 mm. ....**cornelli**

45. Procidentia narrow, nearly twice as long as wide, slightly notched at tip; other structural characters as in female. Length 4 mm. ....**vertebrata**

Procidentia narrow, projecting, squarely truncate at apex, about as wide as long; other structural characters as in female. Length 4.5-5 mm. ....**mendica**

°**P. lata** (Marlatt). *Pteronus latus* Marlatt.

P. limbata (Cresson). *Nematus limbatus* Cresson.

Pteronus limbatus Cresson. Larva feeds on willow. Fairfield, 1 August, 1904 (B. H. W.).

°**P. latifasciata** (Cresson). *Nematus latifasciatus* Cresson. *Pteronus latifasciatus* Cresson. Larva feeds on birch.

P. ventralis (Say). *Nematus ventralis* Say. *Pteronus ventralis* Say. Howard, Insect Book, Pl. xii, Fig. 9. Larva feeds on willow and poplar. Pl. i, Fig. 3. Farmington (E. N.); New Haven.

°**P. marlattii** (Dyar). *Nematus marlattii* Dyar. *Pteronus marlattii* Dyar. Larva feeds on alder.

°**P. harringtoni** (Marlatt). *Pteronus harringtoni* Marlatt.

°**P. fylesi** (Marlatt). *Pteronus fylesi* Marlatt.

°**P. tricolor** (Marlatt). *Pteronus tricolor* Marlatt.

°**P. rufocincta** (Harrington). *Nematus rufocinctus* Harrington. *Pteronus rufocinctus* Harrington.

°**P. dyari** (Marlatt). *Pteronus dyari* Marlatt. Larva feeds on alder.

°**P. erythrogastra** (Norton). *Nematus erythrogaster* Norton.

P. corylus (Cresson). *Nematus corylus* Cresson. *Pteronus corylus* Cresson. *Pteronus erythrogaster* Norton. Howard, Insect Book, Pl. xiv, Fig. 32. Larva feeds on *Corylus.*

°**P. fulvicrus** (Provancher). *Nematus fulvicrus* Provancher. *Pteronus fulvicrus* Provancher. *Nematus salicis* Ashmead. Larva feeds on willow.

P. populi (Marlatt). *Pteronus populi* Marlatt. Larva feeds on poplar. New Haven, 20 July, 1911 (A. B. C.).

°**P. hudsonii** (Dyar). *Nematus hudsonii magnus* Dyar. *Pteronus hudsonii* Dyar. Larva feeds on poplar.

°**P. antennata** Marlatt. *Pteronus antennatus* Marlatt.

P. ribesi (Scopoli). *Nematus ribesi* Scopoli. *Pteronus ribesi* Scopoli. *Nematus ventricosus* of many authors. Imported or Common Currant Worm. Common throughout the state on wild and cultivated currants and gooseberries. New Haven (A. E. V., W. E. B., H. L. V., B. H. W.).

°**P. carpini** (Marlatt). *Pteronus carpini* Marlatt. Larva feeds on ironwood.

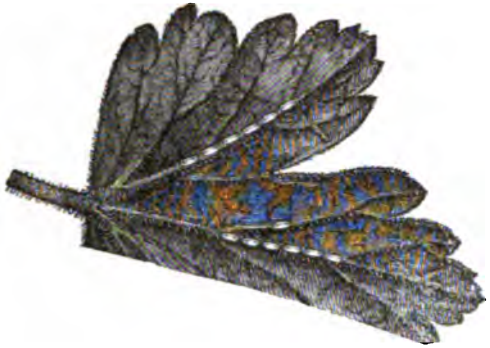

FIG. 3. *Pteronidea ribesi.* Eggs. Twice natural size.

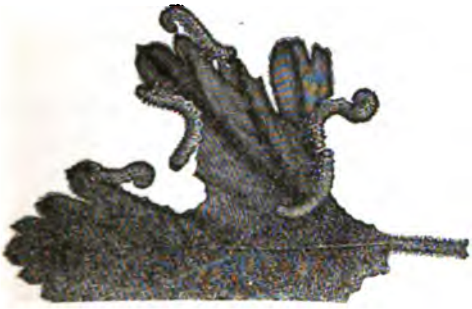

FIG. 4. *Pteronidea ribesi.* Partially grown larvæ. Twice natural size.

FIG. 5. *Pteronidea ribesi.* Fully grown larva. Natural size.

FIG. 6. *Pteronidea ribesi.* Cocoons. Natural size.

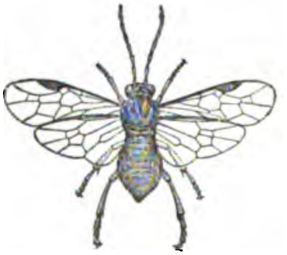

FIG. 7. *Pteronidea ribesi.* Adult female. About twice natural size.

°**P. militaris** (Cresson). *Nematus militaris* Cresson. *Pteronus militaris* Cresson.

P. thoracica (Harrington). *Nematus thoracicus* Harrington. *Pteronus thoracicus* Harrington. Larva feeds on shad-bush. Hamden, 28 May, 1911 (B. H. W.).

°**P. ostryæ** (Marlatt). *Pteronus ostryæ* Marlatt.

°**P. odorata** (Dyar). *Nematus salicis odoratus* Dyar. *Pteronus odoratus* Dyar. Larva feeds on willow.

°**P. cornelli** (Marlatt). *Pteronus cornelli* Marlatt.

P. trilineata (Norton). *Nematus trilineatus* Norton. *Pteronus trilineatus* Norton. *Nematus similaris* Norton. *Nematus robiniæ* Forbes. Howard, Insect Book, Pl. xiv, Fig. 28. Larva feeds on locust. Farmington (E. N.); New Haven, 22 May, 1908 (B. H. W.).

°**P. magna** (Marlatt). *Pteronus magnus* Marlatt.

°**P. quercus** (Marlatt). *Pteronus quercus* Marlatt. Larva feeds on white oak.

°**P. hyalina** (Marlatt). *Pteronus hyalinus* Marlatt. Larva feeds on white birch.

°**P. vertebrata** (Say). *Nematus vertebratus* Say. *Pteronus vertebratus* Say. *Nematus dorsivittatus* Cresson. Larva feeds on willow and poplar.

P. integra (Say). *Nematus integer* Say. *Pteronus integer* Say. Larva feeds on black oak. Connecticut (E. N.); New Haven.

°**P. monochroma** (Norton). *Nematus monochromus* Norton.

°**P. stigmata** (Norton). *Nematus stigmatus* Norton.

P. mendica (Walsh). *Nematus mendicus* Walsh. *Pteronus mendicus* Walsh. *Nematus trivittatus* Norton. Larva feeds on willow. New Haven, 4 May, 1904, 19 April, 1910 (H. L. V., VanDuzee, B. H. W.); Wallingford, 14 June, 1911 (J. K. Lewis).

°**P. pinguidorsum** (Dyar). *Nematus pinguidorsum* Dyar. *Pteronus pinguidorsum* Dyar. Larva feeds on birch.

°**P. longicornis** (Marlatt). *Pteronus longicornis* Marlatt.

°**P. dubia** (Marlatt). *Pteronus dubius* Marlatt.

°**P. lombardæ** (Marlatt). *Pteronus lombardæ* Marlatt. Larva feeds on Lombardy poplar.

Pontania Costa.

Key to Species.

1. Head, including orbits, black.............................. 2
   Head with orbits resinous or ferruginous.................. 5
2. Thorax with collar and tegulæ black; body black, with trochanters, apical half of femora, tibiæ, and tarsi, pallid; clypeus nearly truncate; antennæ with third segment distinctly shorter than fourth; saw-guides slender, tapering, rounded at tip. Length 4 mm...............................**atra**
   Thorax with tegulæ and collar narrowly pale.............. 3
3. Clypeus very slightly concave, almost truncate; body black, with tip of the clypeus, labrum, mouth-parts, extreme angles of pronotum, tegulæ, and legs except bases of coxæ, yellow; antennæ with third and fourth segments subequal; saw-guides elongate, narrow, tapering regularly to tip. Length 4 mm. ....**hyalina**
   Clypeus emarginate 4
4. Head smooth, not coarsely punctate; body black, with apex of clypeus, other mouth-parts, angles of pronotum, tegulæ, and legs for the most part, yellow; antennæ with third segment slightly longer than fourth; saw-guides narrow, regularly tapering or slightly emarginate on lower edge. Length 4 mm. ....**terminalis**
   Head roughened and coarsely punctate; body black, with clypeus, mouth-parts, angles of pronotum, tegulæ, hypopygium, and legs except bases of coxæ, yellowish ferruginous; antennæ with segments three and four subequal; hypopygium narrow, rounded at tip. Length 4 mm. ....**rugulosa**
5. Head with the frontal crest obsolete....................... 6
   Head with the frontal crest present 7
6. Claws coarsely notched; body resinous yellow, with antennæ above, quadrate spot on vertex, quadrate spot on mesonotum, line down center and tip of scutellum, and dorsum of abdomen except the lateral margin, brownish black; antennæ with the third segment a little shorter than the fourth; saw-guides short, broad, rounded at tip, emarginate beneath. Length 4.5 mm ....**robusta**
   Claws very minutely cleft at extreme tip; body yellowish ferruginous, with antennæ, a large spot on head about the ocelli, occiput, mesonotum and metanotum, abdomen except narrow lateral margin, more or less of metaepisternum, and bases of posterior coxæ, black; procidentia not or scarcely projecting. Length 4.5 mm ....**placenta**
7. Head with frontal crest unbroken, not even slightly notched 8
   Head with frontal crest broken or notched................. 12

8. Body in great part black with pale markings................ 9
Body in great part resinous with black markings............ 11

9. Antennæ with third segment longer than fourth; clypeus deeply emarginate, lobes somewhat pointed; ocellar basin sharply defined; saw-guides elongate, narrow, regularly tapering; body black, with apical half of clypeus, mouth-parts, angles of pronotum broadly, tegulæ, and legs for the most part, light yellow; venter of abdomen yellowish, strongly infuscated. Length 5 mm. ....**populi**

10. Surface of body shining, entirely without pubescence; ocellar basin distinctly defined, with rounded walls; frontal crest rather sharp and unbroken; median fovea oval and distinctly defined; saw-guides moderately broad, regularly round at tip; body black, with orbits and face brownish yellow; pronotum, tegulæ, legs for most part, and venter of abdomen, yellowish or resinous; apical half of abdomen of female above, yellow; procidentia not longer than wide. Length 4.5 mm. ....**consors**

Surface of the body clothed with minute yellowish hairs, especially evident on thorax; ridges of ocellar basin almost obsolete; frontal crest well developed; median fovea minute, oval; saw-guides narrow, elongate, regularly tapering or slightly excavated beneath, clothed with short black hairs; body black, with the inner orbits narrowly, and the cheeks, resinous, strongly infuscated; supraclypeal area, mouth-parts, pronotum, tegulæ, legs in great part, and central area of venter of abdomen, resinous infuscated. Length 4 mm. ....**borealis**

11. Stigma broad, rounded on lower margin; body resinous, with base of antennæ, space about ocelli, stripe on each lobe of mesonotum, apex of scutellum, metanotum, dorsal segments of abdomen except the last, extending over sides, large spot on pectus, and saw-guides, brownish black; clypeus broadly and shallowly emarginate; ocellar basin sharply and distinctly defined; antennæ with third segment a little shorter than fourth; saw-guides stout and broad basally, slightly emarginate on lower apical edge, tip obtusely rounded. Length 5 mm. ....**pectoralis**

Stigma narrow, acuminate; body resinous, with antennæ, spot on head back of ocelli extending over occiput, center of lobes of mesonotum, apical half of scutellum, metathorax, basal plates, more or less of abdomen basally and centrally to apex, and saw-guides, black; clypeus shallowly, somewhat angularly notched; ocellar basin with its walls low; antennæ with segments three and four subequal; saw-guides broad, slightly concave on upper margin, and decidedly produced at tip, which is obtusely pointed, with a rather dense tuft of hairs. Length 5.5 mm. .... **acuminata**

12. Dorsum of thorax and abdomen in great part black.......... 13
Dorsum of thorax and abdomen in great part ferruginous.. 16

13. Pale color of inner orbits interrupted; body black, with face below antennæ, posterior and upper orbits, most of pronotum, tegulæ, legs except extreme bases of posterior coxæ and extreme bases of posterior tibiæ, whitish or resinous; clypeus circularly emarginate; ocellar basin distinctly defined; saw-guides broad, strongly acuminate at tip. Length 4 mm. .... **nigrita**
Pale color of inner orbits not interrupted.................. 14

14. Antennæ entirely black; body black, with orbits, face beneath antennæ, pronotum, tegulæ, legs, and venter of abdomen, reddish yellow; head much narrower than thorax; clypeus distinctly circularly emarginate; ocellar basin with ridges rounded and subobsolete; saw-guides elongate, narrow, and tapering. Length 4 mm. .... **gracilis**
Antennæ, at least in part, pale beneath.................... 15

15. Vertex roughened; body in female black, with the face below the antennæ, orbits, mouth-parts, angles of pronotum, tegulæ, and legs except extreme bases of coxæ, ferruginous; clypeus circular and moderately broadly notched with small lobes; ocellar basin distinctly defined; frontal crest strongly developed and very slightly broken by median fovea; saw-guides rather broad, acuminate, not very sharply pointed, hairs rather long and abundant; male differs mainly in having a greater extent of ferruginous. Length 5 mm. .... **pallicornis**
Vertex not roughened; body in female black, with orbits, face below including frontal crest, most of pronotum, tegulæ, legs, extreme bases of posterior coxæ, more or less of central portion of venter of abdomen, including terminal segments, and terminal dorsal segments with the cerci, ferruginous; clypeus rather deeply and angularly notched, lobes triangular; ocellar basin distinctly limited, lateral ridges not very sharply raised; frontal crest prominent, slightly notched at center; saw-guides broad, very slightly emarginate beneath, rounded above, apex rounded; male differs in having antennæ beneath and frontal crest fulvous. Length 4 mm. .... **pisum**

16. Head with ridges about ocellar basin rounded, subobsolete; clypeus rather deeply but angularly emarginate, lobes triangular, rounded; frontal crest broad, rounded, slightly notched; body in female ferruginous, with antennæ except beneath, quadrate spot including ocelli, stripe on center of mesonotum sometimes wanting, spot on either side of scutellum, metathorax in part, basal plates, narrow basal margin of dorsal

segments indistinct toward tip, and saw-guides, black; saw-guides broad and robust, scarcely tapering, rounded at tip; male differs in having more of black on head, thorax for the most part, and dorsum of abdomen, black. Length 4-5.5 mm. ....pomum

Head in female with ridges about ocellar basin well defined and thick; clypeus deeply and narrowly emarginate, lobes rounded; head and thorax strongly punctate; frontal crest large, slightly notched; body ferruginous, with antennæ, large spot including ocelli, stripe on anterior lobe of mesonotum, stripe in front of scutellum, most of metanotum, and dorsum of abdomen except at sides and at apex, brownish black. Male differs in having ocellar basin less distinctly defined. Length 4-5 mm. ....desmodioides

°**P. atra** Marlatt.

P. hyalina (Norton). *Messa hyalina* Norton. Larva makes galls on *Salix fragilis*. New Haven, 19 April, 1910 (B. H. W.).

P. terminalis Marlatt. Larva makes galls on smooth-leaved willow.

°**P. rugulosa** Marlatt.

°**P. robusta** Marlatt. Larva folds the leaves of *Populus tremuloides*.

°**P. placenta** Norton. *Nematus placenta* Norton.

°**P. populi** Marlatt. Larva folds the leaves of *Populus grandidentata*.

°**P. consors** Marlatt. Larva makes galls on *Salix sericea*.

°**P. borealis** Marlatt. Larva makes galls on *Salix sericea*.

°**P. pectoralis** Marlatt.

°**P. acuminata** Marlatt.

°**P. nigrita** Marlatt.

°**P. gracilis** Marlatt. Larva makes galls on *Salix petiolata*.

°**P. pallicornis** (Norton). *Nematus pallicornis* Norton. Larva feeds on willow.

P. pisum (Walsh). *Nematus pisum* Walsh. Larva makes galls on *Salix discolor*. New Haven, 20 May, 1911 (A. B. C.).

°**P. pomum** (Walsh). *Nematus pomum* Walsh. *Nematus hospes* Walsh. Larva makes galls on *Salix cordata* and *discolor*.

P. desmodioides Walsh. *Nematus desmodioides* Walsh. Larva makes galls on *Salix humilis*. New Canaan, 17 September, 1915 (B. H. W.).

Euura Newman.

Key to Species.

1. Frontal crest distinct 2

Frontal crest indefinite and apparently wanting; body black, with the head except a quadrangular spot about the ocelli and extending to the eyes, prothorax, margins of lobes of mesonotum narrowly, upper half of pleuræ, tegulæ, legs, abdomen except above at base, and saw-guides except at apex, resinous; median fovea a minute elongate pit; saw-guides large, upper and lower margins slightly converging, and broadly rounded at apex. Length 7 mm. ....**maculata**

2. Frontal crest unbroken at middle.......................... 3

Frontal crest notched or broken at middle.................. 5

3. Orbits rufous 4

Orbits wholly black; body black, with antennæ, except at base, rufous; tegulæ and legs beyond basal third of femora, yellowish rufous; median fovea distinct, round, pit-like; clypeus deeply, narrowly, angularly emarginate; saw-guides narrow and converging on both margins to a bluntly rounded apex. Length 6 mm. ....**salicicola**

4. Median fovea circular, shallow; body black, with head except a round patch about ocelli, prothorax, legs, venter, and apex of abdomen more or less, rufous; clypeus shallowly, roundly emarginate; saw-guides straight above, and broadly convexly rounded to a blunt point at apex above. Length 7 mm. ....**orbitalis**

Median fovea deep, pit-like, longer than broad; body in female black, with head except a square spot about ocelli and occiput, prothorax, tegulæ, legs, and abdomen except some of the basal dorsal abdominal segments, rufous; clypeus broadly, deeply rounded; saw-guides with two margins converging toward apex, the lower margin strongly oblique, bluntly pointed at apex; apex of saw-guides covered with a dense scopa; male differs in having more black on head and abdomen. Length 7 mm. ....**ovum**

5. Orbits, at least in part, pale.............................. 6

Orbits wholly black; body black, with legs beyond middle of femora, rufous; median fovea shallow, broad, indefinite; frontal crest broken by a very narrow furrow; saw-guides with the two margins gradually converging to a bluntly rounded point at apex. Length 6 mm. ....**nigra**

6. Median fovea indefinite, represented only by a shallow depression in frontal crest; body black, with head except a spot around ocelli and occiput, pronotum, tegulæ, legs, and venter of abdomen, luteous; saw-guides straight above and broadly convexly truncated from the base to a point above at apex. Length 4 mm. ....**minuta**

Median fovea distinct, circular in outline, deep, and longer than broad; body in female black, with head except a spot around ocelli and occiput, prothorax, tegulæ, legs beyond middle of coxæ, and abdomen except more or less at base, rufous; clypeus broadly, shallowly, roundly emarginate; saw-guides straight on upper margins, convex on lower, and obliquely convexly truncated at apex; male differs in having body almost entirely black. Length 6 mm. ....**nodus**

°**E. maculata** MacGillivray.

E. salicicola Smith. Larva makes galls on stems of *Salix alba*. New Haven, 19 April, 1910 (B. H. W.).

***E. orbitalis** Norton. Larva makes galls on stems of *Salix humilis*. Connecticut (E. N.); New Haven, 1, 8 June, 1911 (A. B. C.).

°**E. ovum** Walsh. Larva makes galls on stems of *Salix cordata*.

°**E. nigra** Provancher. Larva makes a witch's broom on *Salix*.

°**E. minuta** MacGillivray.

°**E. nodus** Walsh. Larva makes galls on stems of *Salix longifolia*.

BLENNOCAMPINÆ.

Key to Genera.

1. Genæ broad and distinct, the eyes being distant from the base of the mandibles 2

Genæ narrow and indistinct, hardly more than a line beneath the eyes 9

2. Claws simple, without a tooth................................ 3

Claws always with a tooth, the tooth sometimes small...... 4

3. Antennæ with third segment always distinctly longer than fourth ....**Pareophora** p. 143

Antennæ with third segment subequal in length to fourth **Neopareophora** p. 144

4. Claws with a small tooth within before the apex............ 5

Claws cleft at apex, inner tooth nearly as long as outer.. 7

5. Mesothoracic episternum with a transverse suture near its cephalic margin separating off a presternum .... **Neotomostethus** p. 144

Mesothoracic episternum without a transverse suture near its cephalic margin 6

6. Antennæ with third segment distinctly longer than fourth...... **Ardis**

Antennæ with third segment subequal to or shorter than fourth ....**Rhadinoceræa** p. 144

7. Antennæ with third segment subequal in length to fourth........ **Hypargyricus** p. 144

Antennæ with third segment always distinctly longer than fourth 8

8. Hind wings of female with first anal cell never constricted or petiolated at apex ....**Isodyctium** p. 145

Hind wings of female with first anal cell always distinctly constricted and petiolated at apex ....**Periclista** p. 146

9. Mesothoracic episternum with a transverse suture near its cephalic margin, separating off a presternum .... **Tomostethus** p. 148

Mesothoracic episternum not with a transverse suture near its cephalic margin 10

10. Claws simple, without a tooth ....**Monophadnus** p. 148

Claws always with a tooth, the tooth sometimes small...... 11

11. Claws with one or more teeth within before the apex...... 12

Claws cleft at apex.. 13

12. Claws with an erect tooth at middle ....**Paracharactus** p. 150

Claws with two erect teeth at middle ....**Neocharactus**

13. Hind wings with transverse part of M_3 present 14

Hind wings with transverse part of M_3 wanting 16

14. Antennæ with third segment subequal to or shorter than fourth ....**Phymatocera** p. 150

Antennæ with third segment always longer than fourth...... 15

15. Front wings with radial cross-vein and free part of R_4 inclined at the same angle ....**Monophadnoides** p. 151

Front wings with radial cross-vein and free part of R_4 inclined at different angles ....**Aphanisus** p. 153

16. Front wings with radial cross-vein and free part of R_4 inclined at same angle ....**Blennocampa** p. 154

Front wings with radial cross-vein and free part of R_4 inclined at different angles ....**Erythraspides** p. 155

Pareophora Konow.

°**P. floridana** (Cresson). *Selandria floridana* Cresson. *Blennocampa floridana* Cresson.

Body shining black, with the mandibles rufous at base, the tegulæ and collar white, and the legs beyond the coxæ luteous, more or less suffused with fuscous; wings infuscated, veins and stigma black. Length 5 mm.

Neopareophora MacGillivray.

Key to Species.

1. Pleuræ rufous; body black, with labrum, mandibles, prothorax, tegulæ, mesopleuræ, side lobes of mesonotum, legs, venter and tip of abdomen, yellow or rufous; cerci elongate; saw-guides obliquely truncated at apex; wings hyaline. Length 4 mm. .... **martini**

Pleuræ black 2

2. Antennal furrows broad and distinct, interrupted on the middle of the front by a fine, transverse ridge; body black, with labrum, tegulæ, front legs below coxæ, middle and hind legs below knees, and wings more or less at base, white; cerci hardly exserted; saw-guides large, straight above, broadly convexly rounded to a blunt point at apex. Length 6 mm .... **nigra**

Antennal furrows broad and distinct, not interrupted at middle by a fine transverse furrow; body black, with labrum, mandibles for the most part, front legs, more or less infuscated at base and apex, and middle legs beyond apices of femora, rufous; cerci hardly projecting; saw-guides large and obliquely rounded to a point at apex; wings infuscated. Length 7 mm. .... **scelesta**

°**N. martini** MacGillivray.

°**N. nigra** (Harrington). *Phymatocera nigra* Harrington.

°**N. scelesta** MacGillivray.

Neotomostethus MacGillivray.

°**N. hyalinus** MacGillivray.

Body black, with the tegulæ and the legs below the knees, except the apices of the posterior tibiæ and tarsi, white; median fovea broad and rounded; antennal furrow wanting on the front; wings hyaline. Length 6 mm.

Rhadinoceræa Konow.

°**R. similata** MacGillivray.

Body black; wings strongly infuscated; the postocellar area elevated; ocellar basin distinct; saw-guides rounded at apex to a blunt point above. Length 8 mm.

Hypargyricus MacGillivray.

°**H. infuscatus** MacGillivray.

Postocellar area strongly elevated; saw-guides straight on upper and lower margins and rounded to a blunt point at middle of apex; body black; front femora and tibiæ more or less white in front, suffused with black; wings infuscated. Length 8 mm.

***H. fumipennis** (Norton). *Selandria (Phymatocera) fumipennis* Norton. Howard, Insect Book, Pl. xiv, Fig. 13.

Postocellar area hardly elevated above the posterior orbits; saw-guides straight above and convex below, rounded to a blunt point at apex above; body black; front femora and tibiæ more or less white in front, suffused with black; wings infuscated. Length 8 mm. Larva feeds on *Smilacina racemosa.*

Farmington (E. N.); Hamden, 24 July, 1910 (B. H. W.).

Isodyctium Ashmead

Key to Species.

1. Head wholly or in part pale.............................. 2
   Head wholly black 3

2. Body wholly yellow or rufous, with eyes and antennæ beyond first segment, black; wings, including veins and stigma, yellowish hyaline; postocellar area completely circumscribed; saw-guides concave above and below, prolonged into a narrow truncated projection above at apex. Length 6-7 mm. ....**dilutum**
   Body black, with orbits connected across postocellar area, antennal foveæ, first segment of antennæ in part, supraclypeal area in part, clypeus, spot on mandibles, most of prothorax, tegulæ, median lobe of mesonotum with its lateral margins, a spot on scutellum, pleuræ in part, legs, and abdomen in great part, pale luteous; wings hyaline. Length 6 mm. ....**rileyi**

3. Ocellar basin subobsolete; body black, with clypeus, labrum, mandibles, tegulæ, prothorax, legs, and abdomen beyond basal plates, except a broad fuscous band through the middle of the dorsum, luteous; pleuræ, broad bands on lobes of mesonotum, and scutellum, rufous; saw-guides concave above, convex below, and prolonged above into a marked spine-like projection at apex; wings hyaline. Length 7 mm. ..**caryicola**
   Ocellar basin small, but distinct.......................... 4

4. Clypeus scarcely emarginate; body black, with a spot on supraclypeal area, clypeus, broad bands on lobes of mesonotum, pleuræ, legs, and abdomen, except blackish bands of varying extent on each of the segments, rufous; wings hyaline. Length 6.5 mm. ....**infrequens**
   Clypeus distinctly, angularly emarginate 5

5. Pleuræ in great part black; body black, with clypeus, labrum, spot on mandibles, collar narrowly, tegulæ, a narrow line

on posterior margin of mesopleuræ, a line on the posterior margin of the abdominal segments, broadest on the venter, and the legs, brownish white; a band on posterior margin of each lobe of mesonotum, the scutellum, and the median tergal abdominal segments more or less, rufous; saw-guides concave above, and convex below, broadly rounded at apex to a point above; wings hyaline. Length 6 mm. ....**atratum**

Pleuræ rufous; body black, with clypeus, labrum, mandibles in great part, collar broadly, tegulæ, legs, and abdomen beyond basal plates in great part, luteous, sometimes suffused with rufous; lobes of mesonotum except a black spot on center of each, scutellum, and pleuræ, rufous; saw-guides slightly concave above, and convexly rounded from the base to a point at apex above; wings hyaline. Length 6 mm. ....**murtfeldtiæ**

°**I. dilutum** (Cresson). ***Monophadnus dilutus*** Cresson. Larva feeds on *Quercus alba* and *Quercus prinus.*

°**I. rileyi** (Cresson). ***Selandria rileyi*** Cresson. ***Monophadnus rileyi*** Cresson.

°**I. caryicola** Dyar. Larva feeds on pig-nut hickory.

°**I. infrequens** Dyar. Larva feeds on *Quercus alba.*

I. atratum MacGillivray. Southington, 27 April, 1911 (W. E. B.).

°**I. murtfeldtiæ** Dyar. Larva feeds on black oak.

Periclista Konow.

Key to Species.

1. Pleuræ more or less rufous................................ 2
   Pleuræ wholly black....................................... 4
2. Fourth segment of antennæ distinctly longer than fifth; front finely punctate 3
   Fourth segment of antennæ equal to fifth; front finely striated; saw-guides with their upper margins straight, their lower margins convex at base, concave and constricted into a blunt point at apex; body black, with clypeus, labrum, collar broadly, tegulæ, legs, metapleuræ, venter of abdomen, and greater part of tergum except a band at center, luteous or white; pleuræ, a broad band on apex of each lobe of mesonotum, and scutellum, rufous; wings hyaline. Length 7 mm. ....**purpuridorsum**
3. Ocellar basin uniformly concave; ocellar furrow distinct; body black, with clypeus, labrum, collar broadly, tegulæ,

legs, upper half of pleuræ, mesonotum except black spot at middle, metanotum, scutellum, and abdomen, fulvous; mesonotum and mesopleuræ tending to rufous; wings hyaline. Length 7 mm. ....**marginicollis**

Ocellar basin flat and distinct; ocellar furrow wanting; saw-guides with their upper margins slightly concave above, and with the lower margins convex, and drawn out to a sharp point above at apex; body black, with clypeus, labrum, collar broadly, tegulæ, legs beyond coxæ, and abdomen at sides above and for the most part beneath, luteous shading to brownish; median lobe of mesonotum for the most part, and pleuræ, brown; wings hyaline. Length 5 mm. ....**confusa**

4. Clypeus, if emarginate, not angularly emarginate 5

Clypeus angularly emarginate; body black, with labrum, collar narrowly, tegulæ, legs, and tergum of abdomen for the most part, white, more or less suffused with rufous and fuscous; wings hyaline. Length 7 mm. ....**emarginata**

5. Legs with femora more or less black...................... 6

Legs wholly pale beyond coxæ; body black, with collar narrowly, tegulæ, and legs beyond knees, luteous; femora rufous; ocellar basin distinct; postocellar area twice as broad as long; wings hyaline. Length 6 mm. ....**media**

6. Interocellar furrow not extending onto postocellar area; body black, with collar narrowly, and tegulæ, white; knees and tibiæ luteous; tarsi fuscous; wings hyaline. Length 5.5 mm. .... **chionanthi**

Interocellar furrow extending onto postocellar area; body black, with collar narrowly, and tegulæ, white; legs beyond middle of femora, brown; tarsi more or less dusky; wings hyaline. Length 5.5 mm. ....**subtruncata**

°P. **purpuridorsum** Dyar. Howard, Insect Book, Pl. xiv, Fig. 10. Larva feeds on *Quercus alba.*

°P. **marginicollis** (Norton). *Selandria marginicollis* Norton. *Monophadnus marginicollis* Norton.

°P. **confusa** MacGillivray. Larva feeds on *Quercus obtusiloba.*

°P. **emarginata** MacGillivray. *Mogerus emarginatus* MacGillivray. Larva feeds on *Quercus coccinea.*

°P. **media** (Norton). *Selandria media* Norton. *Monophadnus media* Norton. Larva feeds on *Quercus alba.*

°P. **chionanthi** Dyar. Larva feeds on *Chionanthus.*

°P. **subtruncata** Dyar. Larva feeds on *Quercus coccinea.*

Tomostethus Konow.

Key to Species.

1. Mesonotum and pleuræ rufous............................ 2
Mesonotum and pleuræ black; body black, with labrum, a fine line on collar, tegulæ, front legs below middle of femora, and middle and hind legs beyond knees, white; saw-guides concave above, and broadly convex below, obliquely truncately rounded to a point at apex above; wings hyaline. Length 6 mm. ....**nortoni**

2. Front with large tranverse lateral foveæ; body in female black, with prothorax, mesonotum, mesopleuræ, scutellum, and metanotum, rufous; wings infuscated; saw-guides broadly obliquely rounded at apex; male sometimes has the entire mesonotum black. Length 5-8 mm. ....**bardus**
Front not with large transverse lateral fovæ; body black, with prothorax, upper half of mesopleuræ, lobes of mesonotum, front legs below knees, and knees of middle and hind pair, luteous or rufous; head with a depressed, roughened, shield-shaped area below and including the median ocellus; wings hyaline; saw-guides obliquely pointed to apex above. Length 7 mm. ....**inhabilis**

°**T. nortonii** MacGillivray.

T. bardus (Say). *Allantus bardus* Say. *Selandria barda* Say. *Monophadnus bardus* Say. Pl. i, Fig. 4. Howard, Insect Book, Pl. xii, Figs. 13 and 15. Larva feeds on ash. New Haven, 1904 (B. H. W.).

T. inhabilis (Norton). *Selandria inhabilis* Harris. *Blennocampa inhabilis* Norton. Larva feeds on pear. New Haven, 15 May, 1905, Milldale, 21 May, 1906, Yalesville, 26 May, 1908 (B. H. W.); Watertown, 26 May, 1911 (W. E. B.); Orange, 21 May, 1911 (A. B. C.).

Monophadnus Hartig.

Key to Species.

1. Antennal furrow interrupted on middle of front........... 2
Antennal furrow continuous and distinct from clypeus to occiput; body black, with labrum, tegulæ, and legs below knees, white; scutellum coarsely punctate behind at sides; scutellar appendage flat and impunctate; ocellar basin distinct. Length 7 mm. ....**distinctus**

2. Front with deep, broad lateral foveæ, not connected with antennal foveæ; body black, with tegulæ, corners of pro-

thorax somewhat, and legs below knees, white; scutellum with a few scattered coarse punctures behind; scutellar appendage flat and impunctate; median fovea continuous with ocellar basin. Length 5 mm. .... **minutus**

Front not with a large puncture on each side, sometimes with end of antennal furrow enlarged and punctiform 3

3. Mesonotum with median lobe more densely punctate than lateral lobes; body black, with tegulæ and legs below knees white; saw-guides straight above and below, and obliquely rounded to a blunt point at apex above; apex of scutellum finely densely punctate; scutellar appendage flat and punctate. Length 6 mm. .... **tiliæ**

Mesonotum with the median lobe, if punctate, uniformly punctate with the lateral lobes 4

4. Scutellar appendage flat and not carinate at middle 5

Scutellar appendage longitudinally carinate at middle 6

5. Area in front of median ocellus smooth; body black, with legs below trochanters more or less whitish, sometimes strongly infuscated; wings infuscated; head and thorax impunctate; saw-guides with sides straight and obliquely rounded at apex. Length 6 mm. .... **nubilipennis**

Area in front of median ocellus always more or less roughened; body black, with tegulæ and legs below knees, white; wings slightly infuscated; scutellum coarsely punctate at sides behind; saw-guides obliquely rounded to a blunt point at apex. Length 6 mm. .... **bipunctatus**

6. Scutellum and metathorax uniformly densely punctate; body black, with tegulæ, pronotum for the most part, front legs beyond bases of femora, and middle and hind legs beyond knees, white; front finely punctate; ocellar basin fairly distinct; saw-guides oblique at apex and pointed. Length 5.5 mm. .... **æqualis**

Scutellum more densely punctate than metathorax 7

7. Head with V-shaped furrow behind the median ocellus distinct; body black, with tegulæ, margin of pronotum more or less, and legs beyond knees, white; wings yellowish hyaline; saw-guides with two edges parallel and obliquely truncate at apex. Length 6.5 mm. .... **plicatus**

Head with V-shaped furrow behind the median ocellus indefinite, almost obliterated; body black, with labrum, tegulæ, pronotum entirely, legs beyond knees, and a narrow margin at apex of each tergal and ventral segment, white; wings yellowish hyaline; saw-guides with two sides parallel, squarely truncated at apex, with lower corner rounded. Length 6 mm. .... **transversus**

°**M. distinctus** MacGillivray.

°**M. minutus** MacGillivray.

***M. tiliæ** Norton. *Selandria tiliæ* Norton. Larva feeds on linden. Farmington (E. N.).

°**M. nubilipennis** Norton. *Selandria nubilipennis* Norton.

M. bipunctatus MacGillivray. Stonington, 16 May, 1906 (B. H. W.).

°**M. æqualis** MacGillivray.

°**M. plicatus** MacGillivay.

°**M. transversus** MacGillivray.

Paracharactus MacGillivray.

***P. rudis** (Norton). *Selandria rudis* Norton. *Phymatocera rudis* Norton.

Mesonotum wholly rufous; body black, with the labrum white, and the prothorax, mesonotum, and the metanotum in part, rufous; front legs below the knees, and the knees of the middle pair, white, more or less infuscated; ocellar basin distinct; median fovea broader than long. Length 6 mm.

Connecticut (E. N.).

°**P. obscuratus** MacGillivray.

Mesonotum black, except a small infuscated spot near the bases of the wings; body black, with the tip of the clypeus, the labrum, the supraclypeal area, the angles of the prothorax, the posterior third of the mesopleuræ, and the front and middle legs below the knees, yellow or rufous; ocellar basin indistinct. Length 5 mm.

Phymatocera Dahlbom.

P. rufula Norton. *Selandria rufula* Norton.

Body black, with the clypeus, labrum, and mandibles, rufous, shading onto the front adjacent to the antennal sockets and the proximal segments of the antennæ; tip of the anterior femora longer beneath, rufous shaded with fuscous; head polished; the antennal foveæ wanting below the lateral ocelli, replaced by a sharp ridge extending to the antennal sockets; the antennal sockets deeply and broadly notched above; the area between the ridges concave, polished around the median ocellus, angularly interrupted between the antennal sockets; the supraclypeal area depressed; antennæ with the third, fourth and fifth segments subequal; the saw-guides concave above, and broadly convexly rounded below and at apex to a point above. Length 5.5 mm.

New Haven, 28 July, 1911 (A. B. C.); Farmington (E. N.).

Monophadnoides Ashmead.

Key to Species.

1. Abdomen with dorsal surface rufous 2
Abdomen with dorsal surface black 4
2. Front with a depression around the median ocellus more or less distinct but not V-shaped; body black, with tegulæ, corners of pronotum, and legs beyond bases of femora, luteous; abdomen with greater part of tergal segments two to five rufous; front with lateral fovea; scutellum punctate at apex; saw-guides broad, straight above, broadly convex below, oblique at apex. Length 5.5 mm. ....**rubi**
Front with a V-shaped furrow behind the median ocellus 3
3. Front with a triradiate depression in front of the median ocellus; antennæ with third segment shorter than the fourth and fifth together; body black, with tegulæ, pronotum, front legs beyond trochanters, and middle and hind legs beyond middle of femora, luteous; abdominal segments one to five, yellowish rufous; front with lateral fovea; saw-guides of moderate width, straight above and below, obliquely rounded to a point above at apex. Length 6.5 mm. ....**conspicuus**
Front with a deep, semicircular depression in front of the median ocellus; body black, with angles of pronotum, tegulæ, and legs below knees, white; third segment of antennæ shorter than fourth and fifth together; head smooth and polished; saw-guides straight above and below, obliquely convexly rounded at apex. Length 6 mm. ....**concessus**
4. Front with lateral foveæ 5
Front not with lateral fovæ; if indicated, the puncture broad and shallow 10
5. Scutellum wholly smooth 6
Scutellum punctate or striate at apex 8
6. Antennæ with second segment broader than long 7
Antennæ with second segment longer than broad; body black, with collar narrowly, tegulæ, and legs below knees, white; pentagonal area wanting; saw-guides straight above, convex below, and obliquely, emarginately truncated at apex. Length 5 mm. ....**conspiculatus**

7. Ocellar furrow narrow, deep, and distinct; body black, with angles of pronotum, tegulæ, and legs below knees, white; pentagonal area flattened, walls flat and practically wanting; third segment of antennæ not as long as fourth and fifth together; saw-guides straight above, convex below, broadly obliquely rounded to a blunt point above at apex. Length 6 mm. .... **consobrinus**

Ocellar furrow broad, shallow, and indistinct; body black, with tegulæ, and legs beyond knees, white, except that the tips of the tibiæ and the tarsi are more or less infuscated; pentagonal area wholly wanting; third segment of antennæ as long as fourth and fifth together; saw-guides convex above and below, obliquely truncated to a point above at apex. Length 5 mm. .... **cordatus**

8. Scutellum punctate at apex; front without a V-shaped furrow behind median ocellus; body black, with collar narrowly, tegulæ, and legs below knees, white; third segment of antennæ subequal in length to fourth and fifth together; pentagonal area wanting; saw-guides straight above and below, obliquely rounded to a blunt point at apex above. Length 6 mm. .... **crassus**

Scutellum striate at apex.................................. 9

9. Front with a V-shaped furrow behind median ocellus; body black, with angles of pronotum, tegulæ, trochanters, and legs beyond knees, white; third segment of antennæ subequal in length to fourth and fifth together; pentagonal area wanting; saw-guides broad, straight above, strongly convexly rounded below to apex above. Length 5 mm. .... **conspersus**

Front without a V-shaped furrow behind anterior ocellus; body black, with angles of pronotum, tegulæ, and legs below knees, white; third segment of antennæ shorter than fourth and fifth together; pentagonal area wanting; saw-guides straight above and below, oblique at apex, drawn out into a long point above. Length 6 mm. .... **costatus**

10. Scutellum smooth, or at most extremely finely rugose; body black, with angles of pronotum narrowly, tegulæ, and legs beyond knees, white; antennæ with third segment distinctly shorter than fourth and fifth together; pentagonal area and V-shaped furrow behind median ocellus wanting. Length 6 mm. .... **coracinus**

Scutellum distinctly punctate at sides; body black, with angles of pronotum broadly, tegulæ, apices of coxæ and trochanters more or less, and legs beyond knees, white; antennæ with third segment shorter than fourth and fifth together; pentagonal area indistinctly impressed; V-shaped furrow behind median ocellus distinct; saw-guides broad, convex above and below, broadly obliquely rounded to a blunt point at apex above. Length 6 mm. ....**collaris**

°**M. conspicuus** MacGillivray.

***M. rubi** (Harris). *Selandria* (*Hoplocampa*) *rubi* Harris *Monophadnus rubi* Harris. Raspberry Saw-fly. Larva feeds on *Rubus*. Connecticut (E. N.); Branford, 8 May, 1905 (H. W. W.).

°**M. concessus** MacGillivray.

°**M. conspiculatus** MacGillivray.

M. consobrinus MacGillivray. New Haven, 28 April, 1905 (A. B. Recknagel), 30 May, 1910 (W. E. B.).

°**M. cordatus** MacGillivray.

°**M. crassus** MacGillivray.

°**M. conspersus** MacGillivray.

°**M. costatus** MacGillivray.

M. coracinus MacGillivray. New Haven, 22 June, 1907 (B. H. W.).

M. collaris MacGillivray. Stonington, 13 June, 1907 (B. H. W.).

Aphanisus MacGillivray.

Key to Species.

1. Front with a distinct pentagonal area...................... 2
   Front with pentagonal area entirely wanting.............. 3
2. Pentagonal area with its lateral walls sharp and distinct; front smooth and polished; body black, with pronotum, tegulæ, legs, and a fine margin on apex of abdominal segments, white or luteous; wings somewhat infuscated; scutellum impunctate at sides; front without lateral foveæ; saw-guides broad, straight above, broadly convexly rounded from the base to a hooked point above. Length 5 mm. ....**lobatus**
   Pentagonal area with its lateral walls low and indistinct; front finely rugose; body black, with collar, tegulæ, and legs below knees, white; femora more or less piceous; wings hyaline; scutellum punctate at sides; front without lateral foveæ; saw-guides straight above, convexly rounded below to a blunt point above. Length 5 mm. ....**muricatus**
3. Front with a V-shaped furrow behind median ocellus; body black, with collar, tegulæ, and legs below knees, white;

wings hyaline; scutellum punctate at sides; front with lateral foveæ connected with antennal foveæ; saw-guides straight above, convex below, and obliquely rounded to a point above. Length 5 mm. .... **odoratus**

Front without a V-shaped furrow behind median ocellus; body black, with collar, tegulæ, and legs beyond middle of femora, white; wings hyaline; scutellum roughened at sides; front with lateral foveæ not connected with antennal foveæ; saw-guides straight above and convexly rounded from the base to a blunt point above. Length 6 mm. .... **nigritus**

°**A. lobatus** MacGillivray.

°**A. muricatus** MacGillivray.

A. odoratus MacGillivray. New Haven, 15 May, 1905 (B. H. W.).

°**A. nigritus** MacGillivray.

Blennocampa Hartig.

Key to Species.

1. Antennæ with third segment shorter than fourth and fifth together 2

Antennæ with third segment as long as or longer than fourth and fifth together 3

2. Antennæ with third segment a little longer than fourth; wings fuliginous; body black, with trochanters, front legs in front, and knees and tarsi more or less, pale luteous; tegulæ brown. Length 6 mm. .... **carbonaria**

Antennæ with third segment one and one-half times as long as fourth; wings hyaline; body black, with legs beyond knees shading from piceous to luteous; tegulæ in part, white; head and thorax finely pubescent. Length 6.5 mm. **spirææ**

3. Front with a V-shaped furrow behind the median ocellus 4

Front without a V-shaped furrow; pentagonal area entirely wanting; body black, with tegulæ and legs below knees, white; tibiæ more or less infuscated; clypeus angularly emarginate. Length 5.5 mm. .... **abnorma**

4. Scutellum punctate or striate, at least in part................ 6

Scutellum, smooth, not punctate or striate.................. 5

5. Median fovea with a rounded papilla at center; hind wings with the cell R_{2+3} rounded at apex, without a spur; body black, with tegulæ and legs below knees luteous; front tibiæ and tarsi more or less infuscated; saw-guides convex above and below and convexly truncated at apex. Length 6 mm. **antennata**

Median fovea flat, without a papilla at center, somewhat X-shaped; hind wings with cell R_{1+2} angulated at apex below, with a spur; body black, with tegulæ and legs below knees, except apices of tibiæ and greater part of tarsi, white; saw-guides strongly convex above and below and rounded to a point at apex. Length 6 mm. ....**aperta**

6. Scutellum punctate at sides................................ 7

Scutellum finely striate at sides; body black, with tegulæ and legs below knees, except apices of tibiæ and tarsi, white; median fovea an elongate furrow; saw-guides broad, straight above, convex below, obliquely truncated at apex. Length 6 mm. ....**angulata**

7. Median fovea with a large rounded papilla at center; body black, with tegulæ, and legs, except tips of middle and posterior tibiæ and tarsi, white; hind wings with cell R_{1+2} angular below at apex, without a spur; saw-guides straight above, and convexly obliquely rounded from base to apex below. Length 6 mm. ....**adusta**

Median fovea flat, without a papilla at center; body black, with tegulæ and legs below knees luteous; hind wings with cell R_{1+2} rounded at apex, without a spur; saw-guides broad, straight above and below, broadly convexly and somewhat obliquely rounded at apex. Length 6 mm. ....**acuminata**

°B. **carbonaria** (Cresson). *Selandria carbonaria* Cresson.

°B. **spiraeæ** Dyar. Larva feeds on *Spiræa salicifolia*.

°B. **abnorma** MacGillivray.

°B. **antennata** MacGillivray.

°B. **aperta** MacGillivray.

°B. **angulata** MacGillivray.

°B. **adusta** MacGillivray.

°B. **acuminata** MacGillivray.

Erythraspides Ashmead.

Key to Species.

1. Mesonotum rufous 2

Mesonotum shining black; body black, with apices of coxæ, trochanters, and legs beyond knees, white; posterior tibiæ infuscated; pentagonal area and V-shaped furrow wanting; front without lateral foveæ; saw-guides straight above and below, broadly convexly rounded to a blunt apex; wings in female infuscated; male with wings clearer at apex. Length 5.5 mm. ....**parvus**

2. Lateral foveæ broken by antennal foveæ; body black, with prothorax, mesothorax, and scutellum except at apex, rufous; clypeus and legs for the most part, white; coxæ and tarsi somewhat infuscated; wings somewhat infuscated. Length 6 mm. .... **caryæ**

   Lateral foveæ not broken by antennal foveæ; body black, with tip of clypeus, front and middle legs beyond coxæ, hind coxæ, and hind femora beneath, white; pronotum, mesonotum, and tegulæ, rufous; pentagonal area and V-shaped furrow wanting; front with a pit-like puncture on each side; saw-guides retracted. Length 7 mm. .... **pygmæus**

°**E. parvus** (Cresson). *Blennocampa parva* Cresson. Larva feeds on *Fuchsia*.

***E. caryæ** (Norton). *Monophadnus caryæ* Norton. *Selandria caryæ* Norton. Larva feeds on hickory. Farmington (E. N.).

E. pygmæus (Say). *Blennocampa pygmæa* Say. *Selandria vitis* Harris. Larva feeds on *Vitis*. Connecticut (E. N.).

FENUSINÆ.

Key to Genera.

1. Hind wings with second anal vein wanting, so that the first anal cell is open; base of third anal vein in front wings represented by a dark band 3

   Hind wings with second anal vein present, so that the first anal cell is closed; base of third anal vein in front wings entirely wanting 2

2. Front wings with the radio-medial cross-vein present .... **Profenusa** p. 156

   Front wings with the radio-medial cross-vein wanting ..**Messa** p. 157

3. Radial cross-vein ending in cell R_4 a considerable distance before free part of R_4 ....**Kaliofenusa** p. 157

   Radial cross-vein ending in cell R_3 a considerable distance beyond free part of R_4 ....**Fenusa** p. 157

Profenusa MacGillivray.

P. collaris MacGillivray.

Body in female black, with clypeus, labrum, malar space, mandibles, first segment of antennæ, tegulæ, a narrow margin to the pronotum, and legs for the most part, whitish; prothorax except parts named, cephalic part of mesopleuræ, and pectus, rufous; median fovea minute but distinct; vertical furrows not reaching the occiput; clypeus truncate; saw-guides with dorsal and ventral margins converging, the apex bluntly pointed. Male differs in having rufous part of thorax inclined to whitish and extending over entire pleuræ, venter of abdomen, and a broad band on lateral part of dorsal aspect, broader behind, sometimes fused on meson, whitish. Length 3 to 4 mm. Larva mines leaves of *Cratægus* and *Prunus*.

Messa Leach.

°**M. ambigua** (Norton). *Fenusa ambigua* Norton.

Black, with the two basal segments of the antennæ, the prothorax entirely, the tegulæ, the legs entirely, the abdomen for the most part (sometimes infuscated at apex), white; antennæ with the second segment elongate, the first and second together subequal to the third in length, the third longer than the fourth; wings hyaline, hairy, the veins and stigma brownish; saw-guides straight above, rounded below and at apex to a point above. Length 3.5 mm.

Kaliofenusa MacGillivray.

°**K. ulmi** (Sundewall). *Kaliosysphinga ulmi* Sundewall.

Black, except legs beyond the knees, which are brownish; hypoclypeal area convex, abrupt in front; clypeal furrow prominent, not interrupted by the clypeal area; front elevated, with a broad, shallow median fovea, as broad as the area between the antennæ; antennal furrows extending from the tentorial invaginations almost to the occiput, deep and narrow as far as the anterior ocellus, separated from the occiput by a narrow wall; wings almost hyaline, infuscated along the veins. Length 3.5 mm. Larva mines leaves of the European and American elms.

Fenusa Leach.

°**F. dohrnii** (Tischbein). *Kaliosysphinga dohrnii* Tischbein.

Black, except legs beyond the knees, which are fuscous; head without a distinct furrow between the ocellar and postocellar areas; antennal furrow not expanded into a large pit opposite the middle of the front, and with two distinct toothlike indentations on the median side; saw-guides with the

dorsal margin convex and obliquely rounded at apex, bluntly and roundly pointed above; third segment of the antennæ as long as the fourth and fifth together, the fourth and fifth subequal, the second broader than the fourth. Length 3 mm. Larva mines the leaves of the European alder.

SCOLIONEURINÆ.

Key to Genera.

1. Antennæ with second segment annular, broader than long; first and second segments together shorter than third.... 2
   Antennæ with second segment distinctly longer than broad; first and second segments together as long as or longer than third ....**Melanobates** p. 158
2. Eyes with their inner margins straight and parallel, not converging below; front distinctly wider than high .... **Polybates** p. 158
   Eyes with their inner margins uniformly convex and converging below; front not as wide as high ......**Metallus** p. 159

Melanobates MacGillivray.

M. leucostomus Rohwer.

Body black, with the clypeus, labrum, basal half of the mandibles, angles of the pronotum, and tegulæ, white; legs below the knees brownish white; front around the base of the antennæ indistinctly punctate; median fovea large, circular, and not sharply defined; antennal furrows punctiform above the ocelli; third antennal segment longer than the fourth; the stigma rounded on the radial margin, broadest at the middle. Length 3 mm.

Polybates MacGillivray.

P. slossonæ MacGillivray.

Lateral foveæ united with the antennal foveæ; vertical furrows punctiform; ocellar furrow distinct, broadly concave behind; ocellar basin strongly convex, slightly depressed in front of the median ocellus; median fovea deep, punctiform; antennæ slender, the first and second segments together less than half the length of the third; wings hyaline, the veins, costa, and stigma brown; stigma over twice as long as wide, its hind margin uniformly convexly rounded; saw-guides straight above and below, converging to a bluntly rounded point at apex; body black, with all the legs entirely white. Length 3 mm.

P. secundus Rohwer.

Lateral foveæ distinctly separated from the antennal foveæ; ocellar furrow straight; median fovea small, circular, and well defined; postocellar area broader at the occiput; antennæ with the first segment slightly shorter than the second, the second and third equal; saw-guides like those of the preceding species; stigma about twice as long as its greatest width, broader and somewhat angled at base; body black, with the abdomen piceous and all the legs pale yellow; wings dusky, the veins dark brown. Length 3 mm.

Metallus Forbes.

Key to Species.

1. Stigma three times as long as broad; front not punctate around base of antennæ; body shining black, with median and lateral lobes of mesonotum rufous; labrum, clypeus, mandibles, antennæ, angles of pronotum, tegulæ, anterior and middle legs below bases of coxæ, and trochanters, tibiæ, and tarsi of hind legs, orange white; antennæ with third segment not as long as fourth and fifth together; saw-guides narrow, upper margins straight, apex rounded, curved from upper apex to lower base. Length 4 mm. ....**canadensis**

Stigma twice as long as broad; front not punctate around base of antennæ 2

2. Front wings with free part of M_4+Cu_1 joining cell M_4 distinctly beyond the middle; body reddish yellow, with legs pallid, and head, antennæ beyond second segment, mesopleuræ, pectus, and apex of abdomen, piceous; head with an indistinct transverse carina between antennæ; third antennal segment longer than fourth and not as long as fourth and fifth together; saw-guides straight above, obliquely truncate, and rounded below. Length 3.5 mm. ....**capitalis**

Front wings with free part of M_4+Cu_1 joining cell M_4 at middle 3

3. Mesonotum and scutellum rufous; body black, with the two basal segments of antennæ, middle and lateral lobes of mesonotum, scutellum, its appendage, and postscutellum, rufous; legs with trochanters, knees, front and middle tibiæ and tarsi, posterior tibiæ (more or less infuscated towards apex), and posterior tarsi, yellowish white; saw-guides straight above, convex below, obliquely truncated at apex, rounded at angle below, and sharply pointed at upper apical angle. Length 4.5 mm. ....**rohweri**

Mesonotum and scutellum black........................... 4

4. Ocellar furrow distant from median ocellus, connected with it by a distinct interocellar furrow; depressed area around median ocellus small with precipitous walls, forming a well marked V; median fovea a broad, deep pit, subequal to lateral fovea; body polished, with sparse setigerous punctures, and black, with apices of coxæ, trochanters, knees, tibiæ, and tarsi, white; front femora sometimes only infuscated at apex; saw-guides straight above, oblique at apex, convex below, and rounded to a point at apex above. Length 4 mm. ....**rubi**

Ocellar furrow adjacent to median ocellus, interocellar furrow therefore wanting; depressed area behind median ocellus broad; median fovea a broad, deep pit, larger than lateral fovea; lateral fovea distinct from antennal fovea; body polished, with sparse setigerous punctures; saw-guides straight above, somewhat oblique below, broadly obliquely rounded to a point at apex above. Length 4 mm. **bethunei**

°**M. canadensis** Marlatt.

°**M. capitalis** Norton.

°**M. rohweri** MacGillivray.

M. rubi Forbes. Larva a leaf miner in blackberry and dewberry. New Haven, 6 July, 1904 (H. L. V.).

°**M. bethunei** MacGillivray. Larva a leaf miner in blackberry.

HYLOTOMINÆ.

Key to Genera.

Front wings with cell R_{1+2} not appendiculate at apex; cells R and R_2 coalesced ....**Atomacera** p. 160

Front wings with cell R_{1+2} not appendiculate at apex; cells R and R_2 separate ....**Hylotoma** p. 161

Atomacera Say.

Key to Species.

1. Body black and rufous 2

Body black; wings strongly infuscated; front legs white or piceous beyond knees; head and body polished. Length 4 mm. Without much doubt the male of the following species ....**debilis**

2. Body black, with pronotum, mesonotum, scutellum, and upper part of pleuræ, rufous; wings strongly infuscated; legs paler beyond knees, front pair usually white; mesonotum sparingly punctate. Length 4 mm. ....**ruficollis**

Body black, with abdomen rufous; clypeus, labrum, and palpi, whitish; wings strongly infuscated; legs whitish, anterior tibiæ darker. Length 6 mm. .... **cellularis**

A. debilis Say. Poquonock, 27 June, 1905 (H. L. V.).

A. ruficollis Norton. Poquonock, 27 June, 1905 (H. L. V., B. H. W.).

°**A. cellularis** Say. Larva feeds on sweet potato.

Hylotoma Latreille.

Key to Species.

1. Head, thorax, and abdomen wholly black or blue-black 2
Head, thorax, and abdomen not wholly black.............. 4

2. Tibiæ black; wings strongly infuscated, clearer at tip, a darker spot below stigma. Length 8 mm. .... **cœrulea**
Tibiæ in great part white................................ 3

3. Legs white below knees, except apices of middle and posterior tibiæ and apices of each of their tarsal segments; body entirely black, except parts named; wings strongly infuscated, paler at apex. Length 6 mm. (male) .... **dulciaria**
Legs wholly pale below knees; body black or blue-black, with palpi and legs beyond knees white, tip of posterior tibiæ and their tarsi sometimes somewhat infuscated; wings smoky or hyaline, with a dark spot below the stigma. Length 11 mm. .... **macleayi**

4. Head wholly black.. 5
Head wholly or in great part pale........................ 13

5. Thorax wholly black 6
Thorax wholly or in part pale............................ 8

6. Legs black; abdomen beyond basal plates yellow or reddish yellow; palpi and front tibiæ infuscated. Length 8 mm. **abdominalis**
Legs wholly or in part pale.............................. 7

7. Antennæ usually with apical segments yellow; abdomen usually beyond the basal plates, and legs beyond the knees, yellow; wings and veins yellowish hyaline, with stigma and a spot below it infuscated; remainder of body shining black. Length 10 mm. .... **clavicornis**
Antennæ with apical segment black; abdomen with basal plates and first six abdominal segments yellow; basal half of tibiæ white, shading to fuscous at apex; wings varying from infuscated to yellowish hyaline; stigma and an angular spot beneath it infuscated; remainder of body black. Length 10 mm. .... **virescens**

8. Abdomen black; body in female, except pronotum, mesonotum, scutellum usually, and mesopleuræ frequently, glossy black; the wings strongly infuscated, especially towards the base; male differs usually in having the prothorax yellow and the legs beyond the knees white. Length 8-10 mm. ....**scapularis**

Abdomen wholly or in part pale........................... 9

9. Mesonotum wholly or in part black....................... 10

Mesonotum wholly pale.................................. 12

10. Mesonotum wholly black; body black, with scutellum usually, mesopleuræ, sometimes extending onto pronotum, and abdomen except at extreme apex, red or yellow-red; wings strongly infuscated, lighter toward apex. Length 12 mm. ....**humeralis**

Mesonotum rufous, with black markings 11

11. Mesonotum rufous, with a black spot on each lobe; body black, with mesonotum (except a black spot on each lobe), scutellum, mesopleuræ, and abdomen, red; wings infuscated. Length 10 mm. ....**miniata**

Mesonotum rufous, with a black spot on each lateral lobe; body black, with mesonotum (except a black spot on each lateral lobe), metanotum, scutellum, mesopleuræ, pronotum in part, hind coxæ at middle, and abdomen, red; wings infuscated, clearer toward the tip. Length 12 mm. **sphinx**

12. Ocellar basin with low, broadly rounded walls, not broken above median fovea; body yellow or luteous, with head and its appendages, prothorax in great part, tegulæ, legs, pectus, and saw-guides, black; wings smoky. Length 10 mm. ....**pectoralis**

Ocellar basin with comparatively high, sharp walls, distinctly broken above median fovea; body yellow, with head and its appendages, prothorax in great part, tegulæ, legs, pectus, and saw-guides, black; wings smoky. Length 8 mm. (female) ....**dulciaria**

13. Mesonotum wholly rufous; body rufous, with eyes, labrum, antennæ, tegulæ, spot at base of front wings, and legs, black; first pair of legs sometimes rufous; wings strongly infuscated. Length 10-12 mm. ....**rubiginosa**

Mesonotum more or less marked with black 14

14. Mesonotum black; body red, with antennæ, legs, and a spot on mesonotum, black; wings infuscated, clearer at apex. **coccinea**

Mesonotum rufous with a black spot covering the three lobes of mesonotum and scutellum in part; body rufous, with apices of mandibles, eyes, antennæ, palpi, a spot on meso-

notum, tegulæ, and legs, black; wings infuscated. Length 14 mm. ....rubra

°**H. cœrulea** Norton. Howard, Insect Book, Pl. xiv, Fig. 7. Larva feeds on white birch.

H. dulciaria Say. Connecticut (E. N.).

H. macleayi Leach. Howard, Insect Book, Pl. xiii, Fig. 21. Larva feeds on Chinese honeysuckle, wild cherry, white and black birch, mountain ash, willow, strawberry, and *Amelanchier*. Connecticut (E. N.); New Haven, 27 May, 1906, 4 August, 1905; Colebrook, 20 July, 1905 (W. E. B.).

H. abdominalis Leach. Larva feeds on willow. Orange, 21 June, 1905 (W. E. B.); Westville, 2 June, 1908 (B. H. W.); New Haven, 30 May, 1911 (A. B. C.), 31 July, 18 August, 1910 (B. H. W.).

H. clavicornis (Fabricius). Howard, Insect Book, Pl. xiv, Fig. 12. Larva feeds on willow. Connecticut (E. N.).

°**H. virescens** Klug. Larva feeds on *Betula, Salix,* and *Pyrus*.

H. scapularis Klug. Howard, Insect Book, Pl. xii, Fig. 20. Larva feeds on white birch and elm. New Haven (B. H. W.); Mt. Carmel, 24 June, 1904 (W. E. B.); Yalesville, 26 May, 1908 (B. H. W.).

H. humeralis Beauvois. Howard, Insect Book, Pl. xiii, Fig. 9. Larva feeds on poison ivy. Connecticut (E. N.); Branford, 26 July, 1905 (H. W. W.); Southington, 12 July, 1910 (W. E. B.).

°**H. miniata** Klug. Howard, Insect Book, Pl. xiv, Fig. 17.

°**H. sphinx** Kirby.

°**H. pectoralis** Leach. Howard, Insect Book, Pl. xiii, Fig. 14. Larva feeds on birch.

H. rubiginosa Beauvois. New Haven, 30 July, 1905, 8 August, 1907 (B. H. W.); Lyme, 3 July, 1910 (A. B. C.).

°**H. coccinea** Fabricius.

H. rubra Klug. Howard, Insect Book, Pl. xiii, Fig. 19. Stonington, 26 August, 1906 (J. A. Hyslop).

Schizocerinæ.

Schizocerus LePeletier.

Key to Species.

1. Abdomen wholly or for the most part yellow or rufous...... 2

Abdomen wholly black or with a lateral yellow or rufous band 3

2. Prothorax black; body black, with supraclypeal area, clypeus, labrum, middle and hind coxæ and trochanters, front tibiæ and basal segments of tarsi, metanotum and basal plates sometimes, and abdomen, except apices of saw-guides sometimes, yellow; wings infuscated. Length 8 mm. ....**privatus**

Prothorax wholly or in great part rufous; body in female rufous, with clypeus, labrum, mandibles, antennæ, square area about ocelli, lower orbits, two spots on pectus, legs except front tibiæ and their tarsi in front, basal plates, and saw-guides, black; wings infuscated. Male has body black, with prothorax in great part, tegulæ, knees of all legs, front and middle tibiæ, and abdomen except at apex, yellow or rufous; wings smoky, clearer at apex. Length 7-8 mm. ....**plumiger**

3. Collar more or less pale................................ 4

Collar entirely black; body wholly black, with legs below knees, pale, usually more or less infuscated; antennæ elongate, and more or less infuscated; wings smoky. Length 7 mm. ....**ebenus**

4. Tegulæ and collar narrowly margined with white; body black, with collar, tegulæ, legs below knees, and a broad margin on apex of each abdominal tergite, white, more or less suffused with rufous; head and thorax metallic black, and densely covered with fine, white setæ; wings hyaline, veins brownish. Length 7 mm. ....**sericeus**

Tegulæ and collar broadly yellow; body black, with prothorax, tegulæ, mesonotum more or less on each side, front and middle legs below the knees, tip of posterior femora, base of their tibiæ more or less, and a band along lateral margins of abdomen more or less, yellow; wings hyaline, veins and stigma black or brown. Length 6-7 mm. .... **zabriskiei**

S. privatus Norton. Stonington, 9 August, 1906 (J. A. Hyslop).

°**S. plumiger** (Klug). Howard, Insect Book, Pl. xiv, Figs. 1 and 6.

°**S. ebenus** Norton. Larva feeds on sweet potato.

°**S. sericeus** Norton.

S. zabriskiei Ashmead. Howard, Insect Book, Pl. xii, Fig. 12. Larva feeds on purslane. Westville, 20 June, 1905 (W. E. B.); New Haven, 26 June, 1905, 3, 8 September, 1910, 6 August, 1911 (W. E. B., H. L. V., B. H. W.); Hamden, 24 July, 1910 (B. H. W.); Branford, 30 June, 1911 (W. E. B.).

ACORDULECERINÆ.

Acordulecera Say.

Key to Species.

1. Pronotum entirely white or luteous........................ 2
Pronotum either wholly black or piceous, the collar a narrow, pale margin 7
2. Mesothorax luteous with black markings................ 3
Mesothorax black 6
3. Front impressed about median ocellus, producing a more or less distinct pentagonal area; median fovea triangular and distinct; head black, antennæ fuscous; clypeus, labrum, mandibles, thorax except a spot on each lobe and apex of scutellum, legs, and abdomen, luteous; wings hyaline, costa, veins, and stigma luteous; saw-guides retracted. Length 5 mm. ....**media**
Front not impressed about median ocellus; median fovea wanting 4
4. Antennæ wholly black................................ 5
Antennæ with the two basal segments white; clypeus, labrum, and mandibles, white, remainder of head black; remainder of body luteous, except a black spot on each lobe of mesonotum and the scutellum; wings hyaline; third segment of antennæ but little longer than fourth; saw-guides retracted. Length 4-5 mm. ....**biclinia**
5. Front with short, fine pubescence, so that head appears glossy black; pubescence of antennæ black, antennæ black; head black, with labrum, clypeus, and mandibles white; thorax, except scutellum and a spot on each lobe of mesonotum, legs and abdomen luteous; saw-guides exserted, and broadly, roundly truncated at apex; third segment of antennæ about as long as the fourth and fifth together. Length 4 mm. ....**minima**
Front with long pubescence which conceals glossy black of head and gives it a hoary appearance; antennæ black, with white hairs; head black, with labrum and mandibles white; prothorax luteous; mesonotum and scutellum black; pleuræ and pectus piceous; legs and abdomen luteous; wings hyaline; saw-guides retracted; third segment of an-

tennæ about as long as the fourth and fifth together. Length 5 mm. .... **maxima**

6. Antennæ pale; wings hyaline; body black, with clypeus, labrum, and mandibles, white; prothorax, legs, venter of abdomen and four basal segments of tergum, luteous; antennæ densely hoary, pubescent; saw-guides retracted, teeth of saws rounded; antennæ with third segment but little longer than fourth; front not impressed about median ocellus; median fovea wanting. Length 4 mm. ..... **dorsalis**

Antennæ black; wings more or less infuscated; body black, with clypeus, labrum, mandibles, prothorax, legs, venter of abdomen, and four basal tergal segments at middle and sides, yellow or luteous; head hoary with pubescence; saw-guides exserted, convex above and below, and broadly rounded at apex. Length 5 mm. .... **maura**

7. Antennæ wholly white.................................... 8

Antennæ wholly black or fuscous.......................... 9

8. Front with a median furrow; median fovea wanting; body black, with clypeus, labrum, mandibles, antennæ, tegulæ, legs, basal half of venter, and a large triangular spot on middle of dorsum of abdomen at base, white or luteous; head covered with very fine, white pubescence, appearing bare when viewed from before; notum and pleuræ with fine pubescence; saw-guides with two sides parallel and obliquely truncated to a point at apex above. Length 5 mm. .... **mellina**

Front without a median furrow; median fovea indicated by a minute pit; body black, with antennæ, clypeus, labrum, mandibles, collar narrowly, tegulæ, legs, and basal half of abdomen, greenish white or luteous; head and antennæ covered with long, black pubescence; pubescence of notum short, sparse, and white; saw-guides broadly convexly rounded at apex. Length 4-5 mm. .... **mixta**

9. Pronotum wholly black.................................... 10

Pronotum piceous, margined with luteous; body black, with clypeus, labrum, mandibles, pronotum, and dorsum of abdomen, more or less piceous; tegulæ, legs, and venter of abdomen, luteous; head and thorax densely covered with long pubescence; third segment of antennæ about as long as fourth and fifth together; saw-guides broadly rounded at apex, with a distinct scopa. Length 5 mm. .... **munda**

10. Antennæ with third segment considerably longer than fourth 11

Antennæ with third, fourth, and fifth segments subequal; body black, with clypeus, labrum, mandibles, tegulæ, legs, and disk of abdomen at base, luteous; head and thorax covered with fine, white pubescence; cell R_4 about as broad as long; transverse part of M_2 received near its middle; wings infuscated; saw-guides broad, and broadly rounded at apex. Length 3 mm. .... **minuta**

11. Front wings with transverse part of M_2 given off near middle of cell R_4 12

Front wings with transverse part of M_2 given off nearer to vein R_5 than to the middle of cell R_4; body black, with clypeus, labrum, and mandibles, white, infuscated with piceous; legs, except tips of tarsi, and bases of wings, greenish white or luteous; head and thorax covered with fine, white pubescence; cell R_4 distinctly longer than broad; wings usually more or less infuscated; saw-guides broadly rounded at apex. Length 4 mm. .... **saginata**

12. Wings infuscated on basal half; front wings with cell R_4 about as broad as long; head dilated behind the eyes; body black, with clypeus and labrum more or less white; legs except more or less of the tarsi, and basal half of tergum of abdomen more or less, white; head and thorax covered with fine, white pubescence; saw-guides very broad and squarely truncated at apex. Length 4 mm. .... **maculata**

Wings wholly hyaline; front wings with cell R_4 much longer than broad; body black, with labrum, mandibles, legs, and bases of wings, white; head and thorax covered with short, white pubescence; head not dilated behind the eyes. Length 4 mm. .... **marina**

°**A. media** MacGillivray.

°**A. biclinia** Konow.

°**A. minima** MacGillivray.

°**A. maxima** MacGillivray. Larva feeds on *Quercus alba.*

A. dorsalis Say. Larva feeds on black oak. Connecticut (E. N.).

A. maura MacGillivray. New Haven, 6 July, 1904 (H. L. V.).

°**A. mellina** MacGillivray.

°**A. mixta** MacGillivray.

°**A. munda** MacGillivray.

°**A. minuta** MacGillivray.

A. saginata Provancher. Yalesville, 17 June, 1907 (B. H. W.); Hamden, 14 June, 1911 (W. E. B.).

°**A. maculata** MacGillivray.

°**A. marina** MacGillivray.

XIPHYDRIIDÆ.*

Key to Genera.

Radial and radio-medial cross-veins present ....**Xiphydria** p. 168
Radial cross-vein present, radio-medial wanting ..**Konowia** p. 169

Xiphydria Latreille.

Key to Species.

1. Abdomen in great part black.............................. 2
   Abdomen in great part red or yellow..................... 4

2. Antennæ black; posterior tarsal claws with a moderate-sized tooth 3
   Antennæ white at apex; posterior tarsal claws with a minute tooth; body black, with two small spots above antennæ, orbits extending in a line behind eyes, base of mandibles, two lines on vertex, four lines on notum, a spot before the wings, and seven spots on each side of the abdomen, white; legs honey-yellow; wings hyaline. Length 10 mm. **maculata**

3. Legs rufous or yellow; third antennal segment about twice as long as second; body in female black, with a spot on clypeus, sometimes wanting, line beneath eyes, sometimes interrupted, two spots behind ocelli, posterior orbits, collar, and spot on each side of each abdominal segment, white; tegulæ and legs, honey-yellow. Male has white spots on first four abdominal segments. Length 13 mm. **canadensis**
   Legs black, with bases of tibiæ and tarsi white; third antennal segment subequal in length to second; abdomen with white spots on four basal segments. Length 11 mm. .... **tibialis**

4. Head, thorax, and legs in great part, black; body in female black, with two pale spots behind ocelli, and bases of tibiæ and tarsi, white; abdomen red. Male uniformly dark brown, with a yellow spot on pleuræ and inner orbits, or sometimes entirely reddish yellow. Length 12 mm. **attenuata**
   Head, thorax, abdomen, and legs, honey-yellow; tips of mandibles, spot on vertex, a line above bases of antennæ, lines on neck, sutures of pleuræ, sides of basal plates, and dorsum of following abdominal segments except at middle, brownish. Length 10 mm. ....**erythrogastra**

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* In the preparation of the tables dealing with this and the following families free use has been made of the manuscript of a paper by Dr. J. Chester Bradley, "A revision of the cell R_s group." The portion of this paper dealing with the Siricidæ has been published since this manuscript was submitted, under the title, Siricidæ of North America, in *Journal of Entomol. and Zool.*, 1913, vol. 5, pp. 1-35.

X. maculata Say. Howard, Insect Book, Pl. xii, Fig. 25. Larva bores in maple. Connecticut (E. N.); Wallingford, 1, 25 June, 1910, (D. J. Caffrey).

°**X. canadensis** Provancher. Howard, Insect Book, Pl. xiv, Fig. 34. Larva bores in white birch.

°**X. tibialis** Say.

X. attenuata Norton. Larva bores in birch. Connecticut (W. H. P.).

°**X. erythrogastra** Ashmead.

Konowia Brauns.

°**K. basalis** (Say). *Xiphydria basalis* Say.

Abdomen black, with the two basal segments honey-yellow, more or less mixed with black; legs, except the posterior tibiæ and tarsi, honey-yellow; wings hyaline. Length 8-9 mm.

°**K. walshii** (Westwood). *Xiphydria walshii* Westwood.

Abdomen piceous, with the middle segments margined at sides with white; legs fulvous, with the tips of the tarsi fuscous; antennæ fuscous, with the bases luteous; head black, with two spots behind the ocelli and a line on the lower and posterior orbits, white; collar narrowly, the sides and under surface of the prothorax, and two spots on the mesonotum between the wings, white. Length 9 mm.

SIRICIDÆ.

Key to Subfamilies.

Measured on vein M, free part of M_3 is midway or much nearer to the free part of R_4 than to the radial cross-vein; antennæ filiform, with at least seventeen segments: anal cerci present in male ....Siricinæ p. 169

Measured on vein M, free part of M_3 is opposite the radial cross-vein, or always much nearer to the radial cross-vein than the free part of M_4; antennæ thickened at middle, never with more than fourteen segments; anal cerci wanting in male ....Tremecinæ p. 172

Siricinæ.

Key to Genera.

1. Cornus at apex of abdomen of female constricted at base, spear-shaped; front wings with free part of Cu_3 usually

wanting, sometimes represented by a small spur; head with a white spot behind the eyes 2

Cornus at apex of abdomen of female either shouldered or not, but never constricted at base and spear-shaped; front wings with free part of Cu_2 distinct; head without a white spot behind the eyes; posterior tibiæ with two apical spurs .... **Sirex** p. 170

2. Posterior tibiæ with two apical spurs; ovipositor about as long as the abdomen, and always much shorter than the body .... **Urocerus** p. 171

Posterior tibiæ with only a single apical spur; ovipositor always much longer than the abdomen, and sometimes longer than the body .... **Xeris** p. 171

Sirex Linnæus

Key to Species.

1. Abdomen blue-black 2

Abdomen more or less red 3

2. Legs blue-black; abdomen short, cornus short and shouldered, ovipositor projecting but little beyond its tip; body steel-blue, with first pair of legs below knees dark ferruginous; wings violaceous. Length 35 mm. (female) .... **edwardsii**

Legs rufous; cornus elongate, pointed, not shouldered at base, diminishing gradually in size; body black, with legs beyond trochanters, and base of ovipositor, yellow or rufous; wings hyaline or nearly so, sometimes with a spot below the stigma and apex of the wings infuscated. Length 16-30 mm. (female) .... **cyaneus**

3. Wings violaceous; body blue-black, with legs beyond knees, sometimes the whole of the legs, abdomen beyond first or second segment, cornus, and ovipositor, red; cornus somewhat convex at sides but not distinctly shouldered. Length 28 mm. (female) .... **nigricornus**

Wings hyaline or yellowish, apical margins sometimes somewhat infuscated 4

4. Legs entirely blue-black 5

Legs with posterior femora rufous; body bluish, with posterior legs more or less, and abdomen beyond second or third segment, rufous; wings hyaline or nearly so. Length 15-30 mm. (male) .... **cyaneus**

5. Abdomen entirely rufous beyond basal plates or first segment; antennæ and posterior tarsi sometimes marked with rufous. Length 20 mm. .... **nigricornus**

Abdomen blue-black, with only the fifth or sixth segment rufous (male) .... **edwardsii**

°**S. edwardsii** (Brullé). *Urocerus edwardsii* Brullé. Howard, Insect Book, Pl. xiii, Fig. 3.

S. cyaneus (Fabricius). *Urocerus cyaneus* Fabricius. Howard, Insect Book, Pl. xiii, Fig. 12. Larva bores in spruce and fir. Connecticut (E. N..)

°**S. nigricornus** (Fabricius). *Urocerus nigricornus* Fabricius. Howard, Insect Book, Pl. xii, Fig. 21.

Urocerus Geoffroy.

Key to Species.

1. Abdomen entirely black; body black, with antennæ more or less at middle, a large spot behind each eye, a spot on each side of the seventh abdominal segment, and basal half of tibiæ and tarsi, white; wings strongly infuscated. Length 27 mm. .... **albicornis**

Abdomen wholly or in part yellow or rufous................ 2

2. Wings yellowish hyaline; body black, with antennæ yellow, or yellow at base and brownish toward tip, sometimes black in male; tibiæ and tarsi brown or yellow, posterior tibiæ and tarsi black in male; basal plates, and abdominal segments one to seven more or less yellow. Length 35 mm. .... **flavicornis**

Wings strongly infuscated or violaceous; body black, with antennæ more or less at apex, and basal half of posterior tibiæ and the metatarsi, white; abdomen usually with first and third or fourth apical segments reddish yellow, or at times with entire abdomen reddish yellow. Length 20 mm. **cressoni**

U. albicornis Fabricius. Howard, Insect Book, Pl. xii, Fig. 24. Larva bores in spruce, hemlock, and fir. Connecticut (E. N.).

U. flavicornis Fabricius. *Urocerus abdominalis* Harris. Howard, Insect Book, Pl. xiii, Figs. 17 and 24. Connecticut, (E. N.); Hamden, 15 June, 1911 (A. B. C.).

U. cressoni Norton.

Xeris Costa.

°**X. caudata** (Cresson). *Urocerus caudatus* Cresson. Howard, Insect Book, Pl. xiii, Fig. 29; and Pl. xiv, Fig. 36.

Body black, with a spot behind the eyes and the collar more or less, white; the legs entirely obscure, luteous or brownish; the ovipositor reddish brown; wings subhyaline, more or less stained with fuscous. Length 23 mm.

TREMECINÆ.

Tremex Jurine.

***T. columba** Linnæus. Howard, Insect Book, p. 70, Fig. 41; Pl. xii, Figs. 27 and 23; Pl. xiii, Fig. 31.

Body varying from almost entirely black with yellow triangular marks on the abdomen, to almost yellow with a narrow apical black margin; antennæ usually yellow; legs usually pale, femora black above in dark individuals; wings varying from strongly infuscated to yellowish hyaline. Length 18-40 mm. Larva bores in maple, elm, apple, pear, beech, oak, and sycamore.

Connecticut (E. N).; New Haven (Bolton); East Hartford (W. E. B.).

CEPHIDÆ.

Key to Genera.

1. Radial cross-vein always shorter than first abscissa of radial sector, the two converging toward the radio-medial cross-vein 2
Radial cross-vein subequal in length to or shorter than first abscissa of radial sector, the two subparallel; base of radial sector sometimes atrophied; posterior tibiæ with two preapical spurs .... **Janus** p. 172
2. Posterior tibiæ with one preapical spur........ 3
Posterior tibiæ with two preapical spurs 4
3. Flagellum with first two or three segments usually distinctly contracted; posterior tarsal claws bifid ....**Macrocephus** p. 174
Flagellum never with first two or three segments distinctly contracted, distinctly thicker in the middle than at base or apex; posterior tarsal claws broadly expanded at apex and slightly emarginate between the two portions .... **Adirus** p. 173
4. Abdomen of male with two apical ventral segments with fringes or brushes of bristles, sometimes placed in deep scars; saw-guides of female, as seen from above, widened at apex .... **Trachelus** p. 174
Abdomen of male with ventral apical segments sometimes with short hairs, never with fringes or brushes of bristles; saw-guides of female, as seen from above, with their sides parallel and not widened at apex ....**Cephus** p. 174

Janus Stephens.

Key to Species.

1. Front wings with base of radial sector always present...... 2
Front wings with base of radial sector always atrophied;

body black, with labrum, a line at base of wings and another on scutellum, and a triangular spot on metathorax, white; legs (except a white line on underside of tibiæ, and posterior tibiæ and tarsi which are black) and first and second abdominal segments, rufous; wings entirely hyaline. Length 9 mm. .... **abbreviatus**

2. Front wings hyaline, with a fuscous spot below the stigma; body black, with tegulæ, collar, metathorax in part, and basal third of tibiæ, white; three basal segments of abdomen, and legs, except parts named and posterior tibiæ and tarsi in female which are black, rufous. Length 8 mm. .... **integer**

Front wings hyaline, with a fuscous spot in cells R_5 and M_1; body in female black, with a spot on mandibles, palpi, collar, stripe on pleuræ, spot on coxæ, and trochanters, straw-white; four basal segments of abdomen, and legs below trochanters, yellow-red. Male with antennæ ferruginous, and base of abdomen more or less black. Length 9 mm. .... **bimaculatus**

°**J. abbreviatus** (Say). *Cephus abbreviatus* Say. *Phyllœcus integer* Riley. Howard, Insect Book, p. 71, Fig. 43; Pl. xii, Fig. 22. Larvæ bore in the stems of willow and poplar.

***J. bimaculatus** (Norton). *Cephus bimaculatus* Norton. Farmington (E. N.).

J. integer (Norton). *Cephus integer* Norton. *Cephus flaviventris* Fitch. Currant Stem Girdler. Larva tunnels in the pith of currant. Windham, New Haven (W. E. B.); New Haven, 21 May, 1913 (B. H. W.).

Adirus Konow.

A. trimaculatus (Say). *Cephus trimaculatus* Say. Howard, Insect Book, pl. xiii, Fig. 1.

Body shining black, with two spots on the inner orbits, the base of the mandibles, spots on the clypeus, all sometimes wanting, and a spot on each side of the fourth abdominal tergite, yellow; the whole of the anterior tibiæ and the basal half of the middle tibiæ white; wings varying from hyaline to infuscated. Length 15-18 mm. Larva bores in the stems of blackberry.

Connecticut (E. N.).

Macrocephus Schlechtendal.

°**M. bicinctus** (Provancher). *Cephus bicinctus* Provancher.

Body black, with the cheeks, a small spot on each side of the vertex, a spot on the sides of the metathorax, and the apex of the third and fifth abdominal tergites, white; tibiæ and tarsi brownish; wings hyaline. Length 12 mm.

Trachelus Jurine.

°**T. tabidus** (Fabricius). *Sirex tabidus* Fabricius.

Body black, with the mandibles except at apex, front margin of the clypeus, the front legs beyond the middle of the femora in great part, a band on each side of the abdomen, and a spot at the apex of the fifth and sixth sternites, yellow; wings somewhat infuscated. Length 9 mm.

Cephus Latreille.

°**C. graenicheri** Ashmead.

Abdominal tergites five and six with their apical three-fourths broadly yellow; body black, with the mandibles except at apex, the clypeus, cheeks, palpi, two spots beneath the wings, the legs except the trochanters and tips of the tarsi, a large spot on each side of the second abdominal tergite, practically the whole of the third tergite, a spot on each side and on the dorsum of the fourth, three-fourths of the apex of the fifth and sixth and the apex of the last segment, yellow; wings yellowish hyaline; saw-guides truncate at apex. Length 11 mm.

°**C. pygmæus** Linnæus. Howard, Insect Book, p. 70, Fig. 42.

Fifth abdominal tergite with its apical half and the apical margin of the sixth, yellow; body in female black, with the mandibles at base, the palpi, the legs beyond the knees, always more or less infuscated, the apical half of the third and fourth abdominal tergites, a spot at middle of the apex of the sixth, and the apical margin of the last segment, yellow; wings hyaline; saw-guides broadly rounded at apex. Male differs in having the clypeus, the cheeks, the coxæ, the trochanters and femora beneath, and a spot on the side of the second and fourth abdominal segments, yellow; length 9 mm. Larvæ infest the stems of wheat.

ORYSSIDÆ.

Oryssus Latreille.

Key to Species.

1. Abdomen entirely black; edge of ridge concealing bases of antennæ not strongly reflexed; antennæ distant at base; legs marked more or less with white or reddish; wings hyaline, with a smoky transverse band beyond the middle. Length 8-12 mm. .... **sayi**

Abdomen not entirely black.............................. 2

2. Abdomen with three apical segments red ....**sayi** var. **terminalis**

Abdomen with six apical segments red ....**sayi** var. **occidentalis**

O. sayi Westwood. Larva bores in maple. Stonington, 26 June, 1906 (W. E. B.).

O. sayi var. **terminalis** Newman. Howard, Insect Book, Pl. xii, Fig. 26. Larva bores in maple. Hamden, 15 June, 1911 (W. E. B.); Stonington, 5, 17 June, 1914 (I. W. Davis).

°**O. sayi** var. **occidentalis** Cresson. Larva bores in sugar maple.

ICHNEUMONOIDEA.

From the standpoint of economic parasitology this is one of the most important groups of insects. It is represented in Connecticut by many species. Many of these will, no doubt, prove exceedingly useful in the hands of man when he has learned to breed and manage them for the purpose of controlling injurious insects.

The greatest care must be exercised in classifying the insects of this group, because the multiplicity of species and their close relationship make their recognition a difficult subject indeed. This group is so homogeneous that in order to classify its components a knowledge of the general appearance and character of the insects as a whole, or habitus, is quite essential. Habitus although sufficiently tangible to the experienced eye can not be satisfactorily described, so the beginner must have access to an authoritatively determined collection, or, such not being available, recourse must be taken to a study of the figures of von Vollenhoven in his two works, the Schetzen and Pinacographia.

Inasmuch as the Icheumonoid fauna of this state is imperfectly known, the keys in the following pages cannot be regarded as final, although in many cases they will lead the student to a satisfactory conclusion.

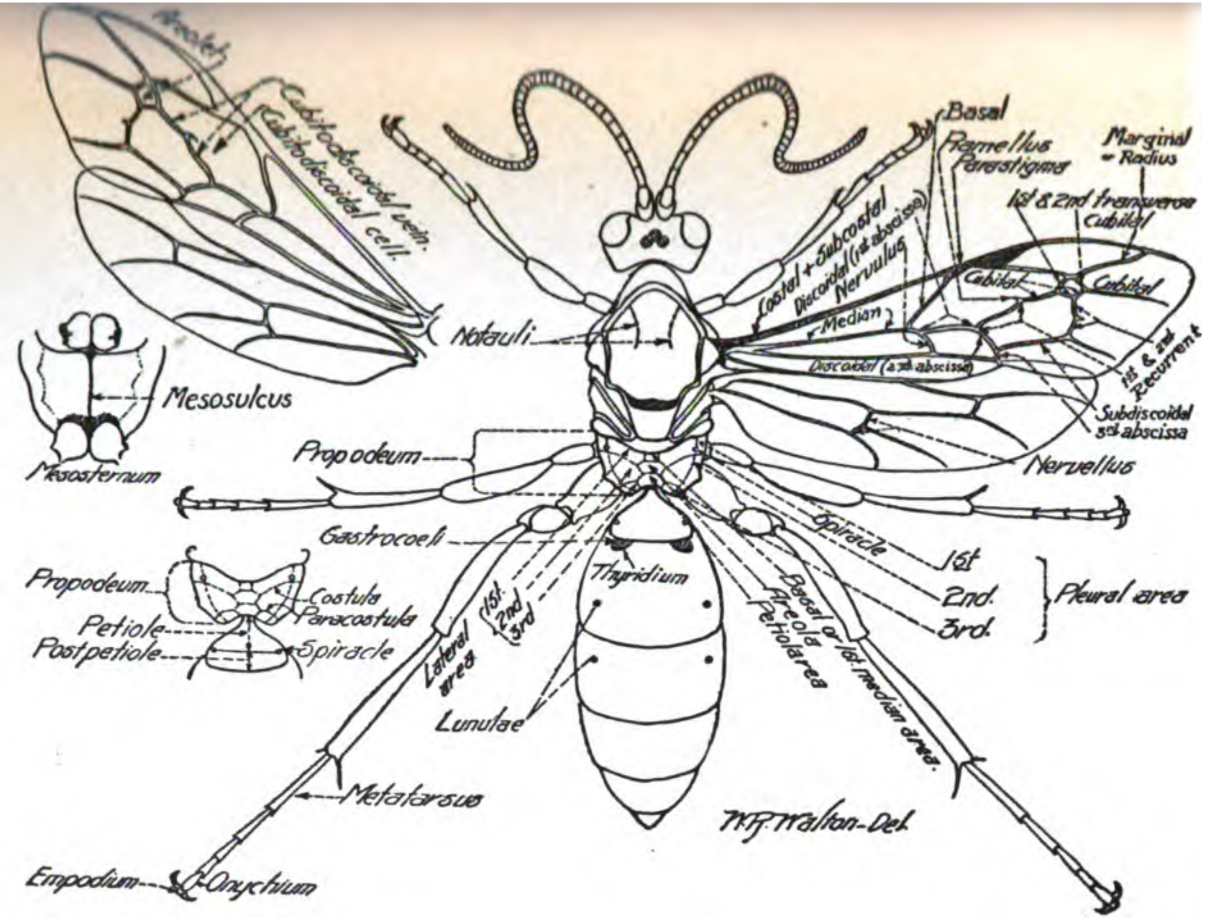

FIG. 8. *Amblyteles centrator.*

NOMENCLATURE OF WING PARTS IN THE DRAWING OF *AMBLYTELES CENTRATOR.*

OLD SYSTEM	COMSTOCK-NEEDHAM SYSTEM
Veins	*Veins*
Costa + subcostal . . . . (In the Ichneumonoidea considered in this work these veins are usually seemingly but not actually coalescent.)	Costa (C) + Sc + R + M
First transverse cubital . . .	r − m and R_s
Second " " . . .	R_4
Cubital	M_{1+2} and $R_{4+5} + M_1$
First recurrent	M_{3+4}
Second "	Transverse part of M_2 or first abscissa of M_2
Basal	M and m − cu
Subdiscoidal	m and M_2
Abbreviated cubital, or stump . .	M
Externomedial	Cu
Discoidal { 1st abscissa . . .	M_4
Discoidal { 2d and 3d abscissa .	M_3
Transverse median of fore wings, or nervulus	$M_4 +$ Cu_1
Marginal or radius { 1st abscissa .	radial cross-vein
Marginal or radius { 2d and 3d abscissa	R_s
Transverse median of hind wings, or nervellus	M_2
Cells	*Cells*
Areolet	R_{4+5}
Cubitodiscoidal	1st $R_1 + R + M_4$

*Key to Families.**

1. Mesothorax with its sternum and pleuræ, or at least the latter, not divided into an anterior and posterior portion by the presence of a carina or suture; in short, without a prepectus 2

Mesothorax with its sternum and its pleuræ, or at least the latter, more or less divided into an anterior and posterior portion by the presence of a carina or suture; in other words, with a prepectus as indicated by Snodgrass...... 6

2. Second and third dorsal segments fused as is evidenced by the apparent second segment having two pairs of spiracles 3

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*This table includes all the known families of Ichneumonoidea.

Second and third dorsal segments not fused, second division of dorsum of abdomen with only one pair of spiracles; all known forms winged; propodeum hardly extending beyond base of coxæ, upper edge of hind coxal sockets or coxal line close to lower edge of abdominal socket or abdominal line 4

3. Cutting edge of mandibles turned inward, their tips meeting or overlapping when mandibles are flexed toward mouth ....VIPIONIDÆ p. 181

Cutting edge of mandibles turned outward, their tips neither meeting nor overlapping when mandibles are flexed toward mouth ....ALYSIIDÆ p. 211

4. Frontal line shorter than clypeo-antennal line, or antennæ inserted above middle of face; wings without a distinct costal cell, i. e., with but three cells running to base of wing 5

Frontal line longer than clypeo-antennal line, or antennæ inserted below middle of face; wings with a distinct costal cell, i. e., with four cells running to base of wings ...... STEPHANIDÆ p. 215

5. Spiracles of first and second dorsal segments in or beyond middle; front wings with only one recurrent vein, first abcissa of cubitus present ....PAXYLOMMIDÆ

Spiracles of first and second dorsal segments before middle; front wings with two recurrent veins, first represented by cubitodiscoidal vein, first abcissa of cubitus wanting BANCHIDÆ p. 216

6. Abdomen with only one or two dorsal segments, or, where with more than two, then with second and third segments fused, so that second division of abdomen has two pairs of spiracles; propodeum hardly extending beyond base of hind coxæ.. 7

Abdomen always with more than two dorsal segments and with only one pair of spiracles to the second division, second and third dorsal segments not fused................. 11

7. Abdomen inserted low down on propodeum, distinctly below middle of latter; upper edge of hind coxal sockets or coxal line close to lower edge of abdominal socket or abdominal line 8

Abdomen inserted high up on propodeum, in middle or above middle of latter; upper edge of hind coxal sockets or coxal line remote from lower edge of abdominal socket or abdominal line ....CAPITONIIDÆ p. 768

8. Cutting edge of mandibles turned inward, their tips meeting or overlapping when mandibles are flexed toward mouth 9

Cutting edge of mandibles turned outward, their tips usually neither meeting nor overlapping when mandibles are flexed toward mouth 15

9. First abdominal segment not cylindrical, but broadened or bulbous toward apex; with or without wings............ 10

First abdominal segment cylindrical or nearly cylindrical, not broadened or becoming bulbous at apex; first abscissa of cubitus of fore wings wanting; wings always present .... AGRIOTYPIDÆ

10. First abscissa of cubitus of fore wings usually present, fore wings with only one recurrent vein; edges of fused second and third dorsal abdominal segments not meeting beneath ....BRACONIDÆ p. 216

First abscissa of cubitus of fore wing wanting, fore wings with two recurrent veins; edges of fused second and third dorsal abdominal segments meeting or overlapping beneath .... BRACONIDÆ p. 216

11. Abdomen inserted low down on propodeum, distinctly below middle of latter, upper edge of hind coxal sockets or coxal line close to lower edge of abdominal sockets or abdominal line 12

Abdomen inserted high up on propodeum in middle or above middle of latter, upper edge of hind coxal sockets or coxal line remote from lower edge of abdominal socket or abdominal line ....EVANIIDÆ p. 239

12. First abdominal segment cylindrical or nearly cylindrical, not broadened or bulbous at apex; first abscissa of cubitus in fore wings present................................ 13

First abdominal segment broadened or bulbous at apex, not cylindrical; first abscissa of cubitus in fore wings usually absent 14

13. First abdominal segment with distinct spiracles a little beyond middle; prepectal carina confined to sternum ...... EUPACHYLOMMIDÆ

First abdominal segment without spiracles; prepectal carina confined to pleuræ ....ROPRONIIDÆ

14. Costal cell distinct ....TRIGONALIDÆ p. 242

Costal cell obliterated by approximation of costal and subcostal veins ....ICHNEUMONIDÆ p. 243

15. Abdomen with only two dorsal segments visible .... VANHORNIIDÆ

Abdomen with at least five dorsal segments and five pairs of lateral spiracles visible, the second and third segments fused LYSIOGNATHIDÆ

VIPIONIDÆ.

Key to Genera.

1. Clypeus not emarginate so as to form a semicircular opening with mandibles.. 2
Clypeus emarginate so as to form a semicircular opening with mandibles; occiput without a ridge or raised line between it and vertex, at most with a faint raised line at sides 7

2. Second submarginal cell large, quadrangular, or wanting; abdomen sessile or subsessile; fore wings with three submarginal cells, anterior margin of marginal cell longer than stigma 3
Second submarginal cell small, often imperfect; mesothoracic sutures invisible; marginal cell reaching or nearly reaching apex of wings; antennæ less than 20-jointed; median cell shorter than submedian...................... 4

3. Marginal and second and third submarginal cells indistinctly defined, marginal cell reaching to apex of wing; marginal vein indistinct beyond apex of second submarginal cell, which is much longer than broad, the recurrent vein received by first submarginal cell ....**Cardiochiles** p. 183
Marginal and second and third submarginal cells distinctly defined; hind femora simple; head transverse, vertex not or scarcely excavate, middle ocellus not surrounded by a fovea; abdomen ovate, not longer than thorax; occiput not margined; anal cell of fore wings without a transverse vein; marginal cell completely closed; second branch of marginal vein much longer than first, whereby second submarginal cell is wider, often very wide; marginal vein not springing from extreme base of stigma; second and third abdominal sutures inconspicuous...........**Opius** p. 182

4. Antennæ 18-jointed 5
Antennæ 14-jointed ....**Mirax** p. 184

5. Fore wings with three submarginal cells, the second complete 6
Fore wings with two submarginal cells; second submarginal cell fused with third, marginal vein obsolete or subobsolete ....**Apanteles** p. 184

6. Spurs of hind tibiæ half or more than half the length of hind metatarsi ....**Microgaster** p. 201
Spurs of hind tibiæ less than half the length of hind metatarsi ....**Microplitis** p. 202

7. Abdomen without or with only one foveolate transverse impression; clypeus without hair tufts at base; face not rostriform 8

Abdomen with numerous broad, strongly foveolate transverse impressions ....**Iphiaulax** p. 209

8. Head not cubical, as seen from above at least twice as wide as long antero-posteriorly 9

Head cubical, as seen from above hardly wider than long antero-posteriorly 10

9. Second abscissa of radius at most hardly longer than first transverse cubitus; propodeum always and abdomen usually sculptured throughout ....**Habrobracon** p. 209

Second abscissa of radius always distinctly longer than first transverse cubitus; propodeum rarely sculptured throughout, abdomen often smooth and polished..**Microbracon** p. 204

10 Scape at most hardly twice as long as thick, and cup-shaped in outline ....**Cœloides** p. 210

Scape distinctly more than twice as long as thick, subcylindrical, supported by a much narrower pedicel, lower portion cut out so as to engage prominent margins of antennal foramina, apex with its margins emarginate posteriorly, channeled anteriorly with margin between anterior and posterior portions produced into a kind of process .... **Atanycolus** p. 210

Opius Wesmael.

Key to Species.

1. Recurrent vein interstitial or received by second cubital cell; second abdominal segment without a transverse impressed line; radius not originating beyond middle of stigma; submedian and median cells equal or nearly equal in length; second discoidal cell closed 2

Recurrent vein received by first cubital cell; second cubital cell much longer than high, second abscissa of radius much longer than first transverse cubitus, radius orginating before middle of stigma but not at its base; notauli indicated only at anterior margin of dorsulum; nervellus without a branch ....**exareolatus**

2. Face beneath antennæ mostly black; scape, pedicel, clypeus, mandibles, tegulæ, coxæ, trochanters, tibiæ, and greater part of apical half of abdomen, almost concolorous, brownish stramineous; tarsi also brownish stramineous, but more or less with dusky stains; notauli extending to beyond middle of mesonotum; palpi more or less dusky; veins and stigma brownish; mandibles not emarginate beneath; second abscissa of radius much shorter than third. Length 4 mm. (female) ....**novæangliæ**

Face beneath antennæ brownish stramineous; scape beneath and part of cheeks concolorous with face beneath antennæ; legs, excepting tarsi and hind tibiæ, mostly blackish stramineous; tarsi dusky; hind tibiæ and their tarsi mostly blackish, the former pale at base; notauli not extending to middle of mesonotum; abdomen mostly blackish; second dorsal abdominal segment almost concolorous with hind femora; stigma and veins blackish; mandibles emarginate beneath; second abscissa of radius not much shorter than third. Length 2.5 mm. (female) ....**pequodorum**

***O. (Allotypus) exareolatus** Viereck (new species).

Female: length 2 mm.; black; scape and pedicel yellowish in front, flagel dark brown or black; tegulæ pale castaneous, wings transparent tinted with brown, stigma and veins brown; legs mostly stramineous except hind tibiæ and tarsi which are dusky; the former with a stramineous annulus at base; abdomen with first, second, fifth and following dorsal segments more or less dark brown, the third and fourth segments mostly blackish; first dorsal abdominal segment longitudinally striate; propodeum rugose. Apparently related to *O. apicalis* Gahan.

Type locality: Branford, 20 July, 1905 (H. W. W.).

***O. (Hypolabis) pequodorum** Viereck (new species).

Remarkable in having the mesonotum divided by a median longitudinal sulcus. Apparently related to *O. americanus* Gahan.

Type locality: West Haven, 27 June, 1905 (H. L. V.).

***O. (Desmiostoma) novæangliæ** Viereck (new species).

Type locality: Connecticut. Type in collection of American Entomological Society, Philadelphia.

Cardiochiles Nees.

Toxoneuron Say.

°**C. populator** Say.

Length 10 mm.; black; abdomen red; wings dark fuliginous; exserted portion of ovipositor longer than the abdomen.

°**C. tibiator** Say.

Length 5 mm.; black; wings hyaline with a fuscous tip; fore tibiæ and tarsi yellowish white; mid tarsi whitish, hind tibiæ white at base. Parasitic on a leaf-roller infesting the black locust.

C. viator Say.

Reddish; length 6-7 mm.; head partly black, appendages of head black; lower half of thorax, propodeum, coxæ, trochanters, base of mid and fore femora, tarsi, and sheaths of ovipositor, black; wings fuliginous; costa and stigma stramineous to testaceous. Lyme, 27 August, 1909 (A. B. C.).

Mirax Haliday.

°**M. aspidiscæ** Ashmead.

Male and female: length 1.3-1.5 mm; black; second flagellar joint about as long as the first; scutel polished; wings with a brownish yellow stigma, first submarginal and first discoidal cells confluent; legs yellowish, sometimes tinged with fuscous, the articulations pale; first, second and third abdominal segments pale.

This is said to be seemingly common as a parasite on the small case-bearing Tineid *Aspidisca splendoriferella,* which occurs on apple and is common on quince in this state.

Apanteles Foerster.

Key to Species.

1. Thorax not depressed, greatest vertical axis apparently as long as or longer than greatest transverse axis; flagel, at least in female, with most of the joints of apical half longer than thick; facial line as long as or shorter than transfacial line 2

Thorax depressed, greatest vertical axis apparently shorter than greatest transverse axis; flagel, at least in female, rather moniliform, most of the joints of apical half as short as or shorter than thick; head not rostriform, facial line apparently as long as or shorter than transfacial line; length 1.75 mm.; black; antennæ dark brown, labrum and mandibles mostly brownish, palpi pale; tegulæ brownish; scutel almost impunctate; wings transparent, tinged with brown; costa, stigma, radius, transverse cubitus and second and third abscissa of cubitus brownish; remaining veins mostly colorless, or at most paler than stigma; coxæ black, trochanters more or less dark, rest of legs mostly stramineous, with hind femora and tibiæ rather reddish with fuscous tips; mesopleuræ not separated from mesosternum by a carinate fold; propodeum rugulose, distinctly carinate down the middle; first dorsal abdominal plate distinctly wider at apex than at base, or than second dorsal abdominal plate is long down the middle, latter plate not sculptured throughout, mostly shining and with indefinite sculpture; third dorsal abdominal segment not sculptured at base or elsewhere except for a few scattered punctures; ovipositor hardly exserted .... **(Stenopleura) podunkorum**

2. Second dorsal abdominal plate subquadrate, trapezoidal, or subtriangular; propodeum usually with a median longitudinal carina, never with a more or less distinct areole **(Protapanteles)** 3

Second dorsal abdominal plate transversely linear or spindle-shaped, two and one-half to three or more times as wide at apex as long down the middle; if less than four times as wide as long, then with an areola on propodeum, or at least without a median longitudinal carina from base to apex 49

3. First dorsal abdominal plate wider at apex than at base, second dorsal abdominal plate usually almost entirely or entirely rugose; first dorsal abdominal plate distinctly as wide as or wider at apex than second dorsal plate is long down the middle; furrow between dorsulum and scutel foveate 4

First dorsal plate as wide at apex as at base or narrower at apex than at base; in *euchætis* first dorsal abdominal plate apparently wider at apex than at base on account of radically converging apical fourth of sides............ 42

4. First dorsal abdominal plate distinctly wider at apex than second is long down the middle...................... 5

First dorsal abdominal plate as narrow as or narrower at apex than second plate is long down the middle; second dorsal abdominal segment distinctly shorter than third, its plate sculptured throughout and nearly transversely oblong; apical half of abdomen compressed; in other particulars agreeing with the description of *acronyctæ* as given below in this table ....**pholisoræ**

5. Pleura not separated from mesosternum by a carinate fold.. 6

Pleura separated from mesosternum by a carinate fold; otherwise as in *acronyctæ*, or *limenitidis* var., as described below in this table, except femora which are pale ....**orgyiæ**

6. Third dorsal abdominal segment sculptured at base in the middle 7

Third dorsal abdominal segment perfectly or virtually perfectly sculptureless at base in the middle............... 28

7. Scutel mostly punctate, or rugulose, or both............... 8

Scutel mostly impunctate, interstices smooth and polished, wings not whitish.. 14

8. Wings whitish 9

Wings not whitish 10

9. Radius, transverse cubitus and third abscissa of cubitus pale stramineous, tegulæ and hind femora mostly brownish ... **nemoriæ**
Radius, transverse cubitus and third abscissa of cubitus brownish, tegulæ blackish, hind femora mostly reddish stramineous (male) .... **winkleyi**
10. Tegulæ brownish or blackish 11
Tegulæ stramineous .... **junoniæ**
11. Hind femora mostly pale 12
Hind femora mostly infuscated .... **limenitidis**
12. Third dorsal abdominal segment almost entirely sculptured, only the hind lateral corners sculptureless............... 13
Third dorsal abdominal segment sculptured only at base; tegulæ blackish, hind femora mostly reddish stramineous **lunatus**
13. Outer face of hind coxæ shining, blackish, inner side brownish, tegulæ brownish, hind tibiæ and tarsi stramineous to testaceous; sculpture of third dorsal abdominal segment extending to hind edge .... **agricola**
Outer face of hind coxæ dull, hind coxæ black throughout, tegulæ blackish, apical third of hind tibiæ and most of hind tarsi blackish; sculpture of third dorsal abdominal segment not extending to hind edge .... **winkleyi**
14. Punctures of scutel large and distinct...................... 15
Punctures of scutel small and indistinct or apparently wanting, hind femora pale 22
15. Outer face of hind coxæ shining 16
Outer face of hind coxæ dull 20
16. Tegulæ stramineous 17
Tegulæ brownish or blackish 19
17. Sculpture of third dorsal abdominal segment not confined to basal half 18
Sculpture of third dorsal abdominal segment confined to basal half; legs, including coxæ, and ventral segments of abdomen mostly stramineous to reddish .... **obscuricornis**
18. Third dorsal abdominal segment almost impunctate and shining down the middle, and with large, shallow, rather ill-defined punctures laterally .... **murtfeldtæ**
Third dorsal abdominal segment impunctate, but with middle third more or less striate .... **fiskei**
19. Hind femora mostly stramineous; second dorsal abdominal plate sharply defined laterally by deep arcuate grooves, dorsal abdominal segments not pale apically ..... **argynnidis**
Hind femora mostly black or blackish; second and third dorsal abdominal segments with a median longitudinal welt **flaviconchæ**

20. Tegulæ stramineous 21
Tegulæ brownish or blackish, hind femora mostly stramineous; sculpture of third dorsal abdominal segment not confined to middle third at base ....**cyaniridis**
21. Hind coxæ mostly black or blackish; second dorsal abdominal segment broadly blackish at base ....**scitulus**
Hind coxæ mostly stramineous; second dorsal abdominal segment stramineous from base to apex, at least laterally **parorgyiæ**
22. Tegulæ stramineous 23
Tegulæ brownish or blackish, hind coxæ mostly black; scape black or blackish 24
23. Antennæ yellowish throughout ....**flavicornis**
Antennæ mostly black or blackish, at least above; hind coxæ mostly stramineous ....**rileyanus**
24. Second dorsal abdominal plate not depressed along apical margin 25
Second dorsal abdominal plate depressed along apical margin ....**hyphantriæ**
25. Sculpture of third dorsal abdominal segment not confined to basal half 26
Sculpture of third dorsal abdominal segment confined to basal half, and not extending to the end of that half; hypopygium shorter than pygidium; mid and hind femora mostly black ....**limenitidis** var.
26. Flagel dark brown, black or blackish 27
Flagel mostly pale, yellowish toward tip ....**xylinus**
27. Abdomen longer than thorax ....**oxyacanthoidis**
Abdomen shorter than thorax ....**delicatus**
28. Tegulæ stramineous 29
Tegulæ brownish or blackish or black 34
29. Hind coxæ mostly black or blackish...................... 30
Hind coxæ mostly stramineous or reddish ....**rufocoxalis**
30. Second dorsal abdominal plate without a median longitudinal welt 31
Second dorsal abdominal plate with a median longitudinal welt 32
31. Third, fourth and fifth dorsal abdominal segments black; hind coxæ black at apex; scape pale ....**augustus**
Third, fourth and fifth dorsal abdominal segments more or less stramineous; hind coxæ stramineous or yellowish at apex ....**crambi**
32. Second dorsal abdominal plate mostly or at least partly polished 33
Second dorsal abdominal plate sculptured throughout; hind coxæ stramineous at apex; scape blackish ......**hesperidivorus**

33. Suture between second and third dorsal abdominal segments distinctly foveate; second dorsal abdominal plate rather rugulose laterally .... **congregatus**

Suture between second and third dorsal abdominal segments indistinctly or not foveate; second dorsal abdominal plate with an indistinct welt .... **hemileucæ**

34. Second dorsal abdominal plate sculptured throughout...... 35

Second dorsal abdominal plate not sculptured throughout.. 39

35. Hind femora pale 36

Hind femora black or blackish; second dorsal abdominal plate shorter down middle than down sides .... **carduicola**

36. Suture between second and third dorsal abdominal segments not sharply defined 37

Suture between second and third dorsal abdominal segments sharply defined .... **acronyctæ**

37. Male antennæ not yellowish beneath, hypopygium not extending beyond pygidium in female 38

Male antennae yellowish beneath .... **lanificus**

38. First dorsal abdominal plate punctate .... **læviceps** var.

First dorsal abdominal plate not punctate .... **læviceps**

39. Hind femora not black or blackish........................ 40

Hind femora mostly black or blackish; second dorsal abdominal plate mostly sculptured .... **theclæ**

40. Hind femora mostly stramineous; second dorsal abdominal plate with its basal half not bounded laterally by deep, foveolate, oblique furrows.............................. 41

Hind femora mostly reddish and fuscous as in *læviceps* ..... **podunkorum**

41. Hind femora unicolorous; flagel partly pale ...... **algonquinorum**

Hind femora with blackish tips; flagel entirely dark brown **pyraustæ**

42. First dorsal abdominal plate as wide at apex as at base, hardly wider at apex than second dorsal abdominal plate is long down the middle, sides of latter parallel on apical half 43

First dorsal abdominal plate distinctly narrower at apex than at base; if apparently as wide at apex as at base, then distinctly wider or narrower at apex than second dorsal abdominal plate is long down the middle................ 45

43. Propodeum with a distinct median longitudinal carina; body mostly black 44

Propodeum without a distinct median longitudinal carina; body mostly stramineous .... **robiniæ**

44. Second dorsal abdominal plate mostly rugulose ......**glomeratus**

Second dorsal abdominal plate almost entirely smooth and polished ....**atalantæ**

45. First dorsal abdominal plate distinctly less than twice as long as wide at base; first and second dorsal abdominal plates at least mostly smooth and polished; hind coxæ black 46

First dorsal abdominal plate at least nearly twice as long as wide at base 47

46. Hind femora black, wings whitish; propodeum without a distinct median longitudinal carina; first dorsal abdominal plate rounded at apex .... **cassianus**

Hind femora mostly stramineous in female, mostly blackish in male ....**euchætis**

47. First and second dorsal abdominal plates sculptured, venter . more or less stramineous; propodeum black or blackish and with a median longitudinal carina; tegulæ stramineous 48

First and second dorsal abdominal plates smooth and polished, the latter plate apparently twice or more than twice as wide at apex as at base ....**militaris**

48. Hind legs including coxæ almost entirely stramineous ...... **radiatus**

Hind legs mostly brownish and blackish and with their coxæ black ....**ornigis**

49. Propodeum without a median longitudinal carina but usually with a more or less distinct areola................. 50

Propodeum with a median longitudinal carina and without an areola; second dorsal abdominal plate transversely oblong and distinctly shorter than third, the latter virtually entirely smooth ....**(Pseudapanteles) consimilis**

50. Propodeum exareolate or at least without costulæ.......... 51

Propodeum areolated or at least with costulæ........... 62

51. Hind femora brownish or blackish; first dorsal abdominal plate at least one and one-half times as long as wide at base 52

Hind femora stramineous or reddish, at least in part; first dorsal abdominal plate nearly one and one-half times as long as wide at base 59

52. Tegulæ stramineous; first dorsal abdominal plate at most apparently only twice as long as wide at base and apparently narrower at apex than at base; scutel polished, virtually impunctate, wings including stigma brownish........... 53

Tegulæ black 54

53. Second dorsal abdominal plate granular, third dorsal abdominal segment sculptured ....**housatannuckorum**

Second dorsal abdominal plate coarsely longitudinally striated, third coarsely sculptured at base ....**ornigis**

54. First dorsal abdominal plate not or apparently not narrower at apex than at base, and with or without a median fovea; third dorsal abdominal segment indistinctly sculptured.. 55

First dorsal abdominal plate apparently narrower at apex than at base 57

55. Second dorsal abdominal plate at least partly smooth and shining; hind femora mostly black or blackish 56

Second dorsal abdominal plate sculptured throughout, not at all smooth and shining .... **gelechiæ**

56. Tibiæ and tarsi mostly stramineous or reddish ....**miantonomoi**

Tibiæ and tarsi mostly blackish ....**melanopus**

57. Second dorsal abdominal plate rugulose.................. 58

Second dorsal abdominal plate smooth and shining, and three-fourths as long down the middle as first dorsal abdominal plate is wide at apex, the latter plate two-thirds as wide at apex as at base; propodeum not punctate but finely sculptured ....**pequodorum**

58. Second dorsal abdominal plate hardly less than one-half as long down the middle as first dorsal abdominal plate is wide at apex ....**lithocolletidis**

Second dorsal abdominal plate nearly twice as long down the middle as first dorsal abdominal plate is wide at apex **aristoteliæ**

59. Second dorsal abdominal plate more than two and one-half times as wide at apex as long down the middle; first dorsal abdominal plate with a median fovea; tegulæ stramineous 60

Second dorsal abdominal plate at most two and one-half times as wide at apex as long down the middle; first dorsal abdominal plate without a median fovea; third dorsal abdominal segment sculptured ....**tortricis**

60. Second dorsal abdominal plate four or nearly four times as wide at apex as long down the middle; propodeum rugose, not at all polished 61

Second dorsal abdominal plate more nearly three times as wide at apex as long down the middle; third dorsal abdominal segment rugulose to beyond basal half; first dorsal abdominal plate apparently wider at apex than at base; all coxæ black or blackish, hind femora reddish with apical third more or less blackish ....**plesius**

61. Hind femora in female stramineous throughout; first dorsal abdominal segment with its membranous portion testaceous, the plate of the same segment apparently as wide at apex as at base ....**edwardsi**

Hind femora in female mostly reddish with blackish tips; first dorsal abdominal segment with its membranous portion blackish, the plate of the same segment apparently a little wider at apex than at base ....**maquinnai**

62. Apical margin of second dorsal abdominal plate straight, not arched, the same plate shorter down the middle than first dorsal abdominal plate is wide at apex............. 63

Apical margin of second dorsal abdominal plate arched or curved 65
63. Hind femora blackish 64
Hind femora stramineous; wings not whitish; propodeum rugose, areola not circumscribed by carinæ; third dorsal abdominal segment partly yellowish; ovipositor prominently exserted .... **conanchetorum**
64. Wings distinctly whitish; first dorsal abdominal plate hardly one and one-half times as long as wide at base and with a median fovea .... **tischeriæ**
Wings not distinctly whitish .... **trachynotus**
65. First dorsal abdominal plate with a median fovea............ 66
First dorsal abdominal plate without a median fovea........ 68
66. First dorsal abdominal plate at least twice as long as wide at apex 67
First dorsal abdominal plate one and one-half times as long as wide at apex; tegulæ blackish; all coxæ blackish; hypopygium brownish .... **lacteicolor**
67. Tegulæ reddish or stramineous; all coxæ black or blackish; venter black or blackish throughout .... **forbesi**
Tegulæ blackish; all coxæ stramineous; venter mostly yellowish; third dorsal abdominal segment yellowish laterally
ninigretorum
68. First dorsal abdominal plate striate........................ 69
First dorsal abdominal plate punctate; hind coxæ and tegulæ mostly stramineous .... **recurvariæ**
69. Hind coxæ black, other coxæ brownish; tegulæ stramineous
carpatus
Hind coxæ stramineous and concolorous with other coxæ; tegulæ black .... **nipmuckorum**

*__A. (Stenopleura) podunkorum__ Viereck.

Host: *Pyrausta futilalis.* Type locality: Berlin, cocoons collected 29 October, 1910; parasites emerged 4 February, 1911 (D. J. Caffrey).

°**A. (Protapanteles) pholisoræ** Riley.

Length 2.4-2.7 mm. Host: *Pholisora catullus.* Cocoons white and solitary.

°**A. (P.) orgyiæ** Ashmead.

Length 2.2 mm. Host: white-marked tussock moth (*Hemerocampa leucostigma*). Said to have been reared from a hibernating chrysalis.

*__A. (P.) nemoriæ__ Ashmead.

Length 1.8-2 mm. Reared August, 1883, from larvæ of *Nemoria*, probably *N. gratata,* which fed on *Euphorbia corollata;* 26

July, 1892, from larvæ of *Eucrostis chloroleucaria*. Cocoons yellow and solitary. Type locality: Suffield.

°A. (P.) **junoniæ** Riley.

Length 2.6 mm. Host: *Junonia cœnia*. Cocoons whitish and solitary.

°A. (P.) **parorgyiæ** Ashmead.

A. (P.) **limenitidis** Riley.

Length 2-2.5 mm. Host: (*Limenitis*) *Basilarchia archippus*. Cocoons whitish and solitary. New Haven, 31 October, 1903.

A. (P.) **limenitidis** Riley, var.

New Haven, 23, 30 October, 1903, reared from yellowish cocoons in bunches on clover; Poquonock, 27 June, 1905 (H.L.V.).

A. (P.) **lunatus** (Packard) Weed.

Length 3 mm. Host: *Papilio polyxenes*. Cocoons solitary and dull yellowish. Yalesville, 19 October, 1903 (H .L. V.).

*A. (P.) **agricola** Viereck (new species).

Female: length 2.5 mm. In addition to the characters given in the table this species differs from *lunatus* in the hind coxæ being reddish brown on the inner side, in the brownish, translucent tegulæ, in the more prominent, reddish brown hypopygium, and in the more or less reddish brown fore and mid coxæ.

Type locality: West Haven, 27 June, 1905 (H. L. V.).

*A. (P.) **winkleyi** Viereck (new species).

Female: length 2 mm; closely related to *agricola*, but differs in the hind coxæ being black or blackish on the inner side, in the hypopygium being more as in *lunatus*, and in nearly all of the apical half of hind tibiæ being deep fuscous to blackish. Paratypes from East River were reared by Dr. Charles R. Ely from *Eupithecia miserulata* Grote, on iron-weed, 27, 29 August, 2 September, 1910. Male: very nearly like the female, but with the sculpture of the third dorsal segment rather vague. Male allotype is in the U. S. National Museum. Cocoons occur singly, and are whitish, covered with loose silk.

Type locality: Branford, 28 July, 1905 (H. W. W.).

*A. (P.) **obscuricornis** Viereck (new species).

Female: length 2 mm; sculpture of third dorsal segment confined to the middle third; fourth and following dorsal segments brownish down the middle and laterally, yellowish between; scape mostly pale, rather stramineous.

Type locality: New Haven, 4 July, 1905 (H. L. V.).

°A. (P.) **murtfeldtæ** Ashmead.

Has been reared from a Geometrid on *Rubus*. Cocoons whitish and solitary.

°A. (P.) **fiskei** Viereck.

Parasitic on *Parorgyia*. The parasites emerge from the ventral surface of the larva, where they spin their white cocoons all of which are collectively enveloped by white fluffy silk. The aggregation of cocoons forms a kind of cushion on which rests the dead larva.

A. (P.) **flaviconchæ** Riley.

Length 2-2.5 mm. Host: army worm, (*Leucania, Heliophila*) *Cirphis unipuncta*. The cocoons of this species are yellowish collected in bunches. Branford, June, 1880.

°A. (P.) **argynnidis** Riley.

Length 2-2.2 mm. Host: *Argynnis cybele*. Cocoons white and solitary.

°A. (P.) **scitulus** Riley.

Length 2.5 mm. Cocoons in bunches and enveloped in white floss-like silk.

°A. (P.) **cyaniridis** Riley.

Length 2.8 mm. Host: (*Lycæna*) *Cyaniris pseudargiolus*. Cocoons white and solitary.

°A. (P.) **flavicornis** Riley.

Length 2 mm. Host: (*Nisoniades*) *Thanaos juvenalis*. Cocoons white and in bunches.

°A. (P.) **rileyanus** Viereck. *A. emarginatus* Riley.

Length 2.4-2.6 mm. Host: *Papilio troilus*.

°A. (P.) **hyphantriæ** Riley.

Length 3 mm. Host: *Hyphantria cunea*.

*A. (P.) **oxyacanthoidis** Viereck.

Female: length 3 mm.; closely related to *delicatus*, face more shining and mouth dark. New Haven, 14 May, 1904, on flowers of *Ribes oxyacanthoides* (H. L. V.).

A. (P.) delicatus Howard.

Length 2.8 mm. Host: white-marked tussock moth (*Hemerocampa leucostigma*).

°**A. (P.) xylinus** (Say).

Length 2.5 mm. Host: *Smerinthus geminatus.*

°**A. (P.) rufocoxalis** Riley.

Length 2.5 mm. Cocoons white, spun together in a ball covered with loose silk.

***A. (P.) augustus** Viereck (new species).

Female: length 2.5 mm.; closely related to *crambi;* fore and mid coxæ blackish at base, hind coxæ black, blackish at apex, stigma blackish, wings with a dark tinge.

Type locality: New Britain, 31 August, 1908, No. 265 (W. E. B.).

°**A. (P.) crambi** Weed.

Length 2 mm.; black; palpi white; mandibles stramineous; venter, together with dorsum of third abdominal segment, stramineous; dorsum of segments posterior to the third piceo-stramineous; legs red (except claws of fore and mid legs and tips of femora and tarsi of hind legs, all of which are piceo-stramineous, and hind coxæ, which are black tipped with red); wings hyaline; tegulæ stramineous, veins whitish; antennæ blackish, scape pale beneath; propodeum reticulated; first and second dorsal abdominal plates longitudinally rugulose; ovipositor concealed.

Hosts: *Crambus zeellus, C. exsiccatus.* Cocoons whitish, adjoining, honeycomb-like.

***A. (P.) hesperidivorus** Viereck.

Female: length 1.75 mm.; differs from *crambi* especially in the uniformly dark brown to blackish antennæ, in the almost impunctate, polished scutel, and in the black or blackish dorsal segments of the abdomen.

Type locality: East River, reared from a skipper larva on oak, 5 August, 1910, by Dr. Charles R. Ely. Cocoons white, covered with loose silk and loosely grouped together.

A. (P.) congregatus (Say).

Length 2.5 mm. or longer; black; palpi white; wings hyaline; stigma fuscous; first and second dorsal abdominal plates densely punctate or minutely lineated; venter along the middle pale yellow; legs stramineous, hind tibiæ at tip and hind tarsi dusky. This is an American parasite of the cosmopolitan *Plusia brassicæ*; it is also parasitic on the following and possibly on other Lepidoptera: *Ampelophaga myron* (W. E. B.); army-worm [(*Leucania, Heliophila*) *Cirphis unipuncta*], *Philampelus pandorus,* and the tobacco worms (*Protoparce celeus* and *P. carolina*). Cocoons white and attached to the larva as shown Plate vii, Fig. 1.

Generally distributed, and has been bred in August by W. E. Britton and R. P. Tolman. Connecticut data are as follows: Westville, 9 August, 1905 (W. E. B.); Norwalk, 3 August, 1887 (C. V. Riley); Southington, 24 August, 1906 (R. P. Tolman); Hartford, 7 April, 1903 (Mrs. W. Seliger).

°**A. (P.) hemileucæ** Riley.

Cocoons white and attached to the larva in the same way as those of *congregatus.*

°**A. (P.) carduicola** (Packard).

Length 3 mm.; black; palpi pale, stramineous; coxæ and trochanters black; basal third to half of fore femora black, remainder of same reddish and concolorous with the tibiæ, tarsi brownish to blackish; mid and hind femora blackish, their tibiæ reddish with a slight dusky tinge, tarsi pale at base, becoming black toward tip; propodeum without a median longitudinal carina; ovipositor hardly exserted.

Host: (*Pyrameis*) *Vanessa cardui.*

°**A. (P.) acronyctæ** Riley.

Male: length 2.5 mm.; black; labrum and mandibles stramineous; palpi whitish, antennæ blackish stramineous; legs light reddish, hind coxæ black; wings hyaline; veins and stigma stramineous; propodeum granulated or finely reticulate, with an indistinct median longitudinal carina; abdomen with first and second dorsal abdominal plates confluently punctate, opaque, remainder smooth and shining, lateral edges on first and second dorsal abdominal segments and sides of the corresponding ventral segments stramineous.

Parasite of (*Acronycta*) *Apatela oblinita.* Cocoons white and spun together, the groups covered with fluffy silk.

***A. (P.) lanificus** Viereck (new species).

Cocoons as in *acronyctæ*. Type locality: Branford, 29 June, 1905 (Ruth Winkley).

A. (P.) læviceps Ashmead.

Parasitic on *Loxostege sticticalis*. New Haven, 1 August, 1906 (P. L. B.), 4 July, 1905 (H. L. V.); Hartford, reared in laboratory, 10 February, 1904.

°**A. (P.) theclæ** Riley.

Male: length 2-2.6 mm.; black; palpi white; labrum and mandibles blackish; antennæ sometimes blackish; propodeum with a slight median longitudinal carina; wings hyaline; tegulæ, stigma and costa beyond stigma, radius and veins at base of the incomplete areolet, blackish; tibiæ and tarsi stramineous; apical half of hind tibiæ and hind tarsi blackish; abdomen with first and second dorsal abdominal plates with numerous punctures; ovipositor not exserted.

Parasitic on an unknown species of *Thecla*. Cocoons white and spun together, making a mat for the dead larva.

***A. (P.) algonquinorum** Viereck (new species).

Type locality: Thompson, 15 July, 1905 (H. L. V.); bred from cocoons on water-hemlock (*Cicuta*).

***A. (P.) pyraustæ** Viereck.

Type locality: East River, reared 7 August, 1909, from *Pyrausta futilalis* by Dr. Charles R. Ely.

°**A. (P.) robiniæ** (Fitch). The Locust Leaf-miner parasite.

Length 2 mm.; female with tip of abdomen often dusky; wings pellucid whitish, veins colorless. Host: flattened locust leaf-miner (*Anacampsis robinella* Fitch). Cocoons white and promiscuously arranged.

°**A. (P.) glomeratus** (Linnæus). *A. pieridivora* (Riley). *A. pieridis* (Packard).

Length 2.6-3 mm.; black; mandibles pale brownish or stramineous; antennæ black, lower side of basal joint and base of flagel often brownish; palpi from pale stramineous to quite yellow in color; dorsulum coarsely punctate, polished, and sparsely pubescent; propodeum generally with a well defined, slender, median longitudinal carina; tegulæ brownish to black; wings with costa, stigma and radial vein quite dark brown as a rule, the remaining veins lighter; legs stramineous, hind coxæ black, sometimes brownish beneath, tip of hind tibiæ either black or dusky or concolorous, hind tarsi generally dusky; abdomen with a more or less distinct median welt on the second dorsal segment; lateral margin of first and second and generally of the third dorsal abdominal segments stramineous to reddish, ventrally this color takes up all of two or three segments; ovipositor slightly extended beyond tip of abdomen, often entirely hidden from above. Cocoons lemon-yellow.

This European parasite of the cabbage-butterfly, (*Pieris*) *Pontia rapæ*, was, in 1883, purposely introduced into the United States by the United States Government. During the autumn of 1904 it held its host under complete control in the District of Columbia, killing every " worm " which came under the observation of Mr. F. H. Chittenden. In Europe it is said to be parastic on the gipsy moth (*Porthetria dispar*), (*Pyrameis*) *Vanessa atalanta*, (*P.*) *V. cardui*, *Vanessa urticæ*, *Aporia cratægi*, *Bombyx mori*, and other Lepidoptera.

°**A. (P.) atalantæ** (Packard). Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 13. Hosts (*Pyrameis*) *Vanessa atalanta*, (*Vanessa*) *Aglais milberti*. Cocoons pure white in color, arranged on end, side by side, in masses covered with loose silk.

°**A. (P.) cassianus** Riley.

Host: (*Terias*) *Xanthidia nicippe*. Cocoons slaty in color and solitary.

°**A. (P.) euchætis** Ashmead.

Cocoons whitish and bunched together.

A. (P.) militaris Walsh.

Parasitic on the army-worm (*Leucania, Heliophila*) *Cirphis unipuncta*. Cocoons whitish with a brownish tinge and bunched together.

Orange, July, August, 1914 (W. E. B.).

A. (P.) radiatus Ashmead.

Has been reared from an unknown larva feeding on leaves of *Plantago major*. New Haven, 4 July, 1905 (H. L. V.).

°**A. (Pseudapanteles) consimilis** Viereck.

Female: length 3.5 mm.; flagel blackish brown throughout, scape and pedicel mostly yellowish, mandibles yellowish tipped with castaneous, palpi whitish; tegulæ, base of wings, fore and mid legs, hind femora, hind coxæ apically, membranous portion of first and second dorsal abdominal segments and sides and venter of the third, all mostly stramineous; hind coxæ basally castaneous, hind tibiæ pale yellowish at base, merging into castaneous, then into blackish brown, hind tarsi dark brown, each joint pale at base; otherwise mostly black; wings hyaline, stigma uniformly dark brown, first abscissa of radius, transverse cubitus and third abscissa of cubitus brownish, second abscissa of median vein, first abscissa of discoidal vein, nervulus and costa more or less stramineous to brownish, other veins almost colorless; exserted portion of ovipositor nearly as long as the abdomen.

°**A. (Apanteles) ornigis** Weed.

Male: length 2-2.5 mm.; palpi white; labrum and mandibles stramineous; fore legs red except coxæ and apical joint, which are blackish; legs with more or less black on their coxæ, femora, and tibiæ; hind legs fuscous, their coxæ black; sides and ventral portions of anterior segments of the abdomen more or less stramineous; wings hyaline, tegulæ piceous; veins stramineous, stigma darker; first and second dorsal abdominal plates reticulated, as is the base of the third segment; basal dorsal abdominal segment with stramineous borders.

Parasitic on *Ornix geminatella*. Cocoons white and solitary.

***A. (A.) housatannuckorum** Viereck (new species).

Type locality: New Haven, 23 August, 1906 (W. E. B.).

***A. (A.) miantonomoi** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.); also from New Haven, 7 May, 1904, on flowers of currant (*Ribes rubrum*); Branford, 27 June, 1904, on flowers of day-lily (*Hemerocallis fulva*) (H. L. V.).

***A. (A.) melanopus** Viereck (new species).

Type locality: New Haven, 1 August, 1906; labeled, bred from pupæ of cabbage-butterfly, (*Pieris*) *Pontia rapæ* (P. L. B.); also from New Haven, 4 July, 1905 (H. L. V.).

***A. (A.) pequodorum** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.), also from New Haven, 4 July, 1905 (H. L. V.).

°**A. (A.) lithocolletidis** Viereck.

Reared from *Lithocolletis* on sweet fern by W. D. Kearfott.

°**A. (A.) aristoteliæ** Viereck.

Reared from *Aristotelia fungivorella* by W. D. Kearfott.

°**A. (A.) tortricis** (Ashmead). *Protapanteles tortricis* Ashmead.

Reared from a Tortricid larva feeding on *Comptonia asplenifolia*. Cocoons white and solitary.

***A.** (**A.**) **gelechiæ** Viereck.

Type locality: East River, reared from *Gelechia trialbamaculella*, August, 1910, by Dr. Charles R. Ely.

°**A. (A.) plesius** Viereck.

Reared from a larva on white oak, by W. D. Kearfott.

°**A. (A.) edwardsi** Riley.

Female: length 2.6 mm.; black; legs pale yellowish brown; antennæ blackish, palpi light yellow; tegulæ light stramineous; wings with their stigma and costa piceous, veins paler; hind femora dusky at tips, hind tibiæ nearly black at tips, hind tarsi brownish; first dorsal abdominal segment with the side pieces blackish brown; first and second dorsal abdominal segments strongly punctate, third but slightly so and only on the anterior border; ovipositor with its exserted portion longer than the abdomen.

This is a parasite of the admiral butterfly, (*Pyrameis*) *Vanessa atalanta*. Cocoons white and solitary.

***A. (A.) maquinnai** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.).

***A. (A.) conanchetorum** Viereck (new species).

Type locality: Branford, 28 July, 1905 (H. W. W.).

A. (**A.**) **tischeriæ** Viereck.

This is a parasite of the trumpet leaf-roller of the apple (*Tischeria malifoliella*).

A. (**A.**) **trachynotus** Viereck.

The late Prof. J. B. Smith claimed to have reared this species from *Pegomyia vicina*, infesting *Chenopodium*. The species has been collected in Connecticut at the following places: New Haven, 20 July, 1904, 19 July, 1905 (B. H. W.), 26 May, 1904 (H. L. V.); West Haven, 27 June, 1905, Putnam, 12 July, 1905, and Colebrook, 27 July, 1905 (H. L. V.).

A. (A.) **recurvariæ** Ashmead.

Female: length 1.65 mm.; clypeus, mandibles, scape, abdomen at sides and beneath, second dorsal abdominal segment, and legs except spot at apex of hind femora, stramineous; apex of hind tibiæ and hind tarsi, except basally, where they are fuscous, stramineous; wings hyaline, stigma brown; second dorsal abdominal plate trapezoidal and sculptured, rest of abdomen smooth and punctate; ovipositor prominent.

Bred from *Recurvaria juniperella* and *R. thujaella,* Yalesville, 19 October, 1903 (H. L. V.).

A. (A.) **forbesi** Viereck.

West Thompson, 12 July, 1905, Cheshire, 8 July, 1904 (H. L. V.).

*A. (A.) **ninigretorum** Viereck (new species).

Type locality: New Haven, 26 May, 1904 (H. L. V.).

A. (A.) **carpatus** (Say).

Mr. W. D. Kearfott has reared this species from *Tinea pellionella.* New Haven, 4 August, 1905, bred from the white-marked tussock moth (*Hemerocampa leucostigma*).

*A. (A.) **nipmuckorum** Viereck (new species).

Type locality: Salisbury, 27 August, 1904 (W. E. B.).

A. (A.) **lacteicolor** Viereck.

This European species was originally introduced into the state of Massachusetts on account of its effectiveness against the brown-tail moth (*Euproctis chrysorrhœa*). It attacks the small caterpillars of both the brown-tail and the gipsy moth, and hibernates with the former. In the spring the larva of the parasite emerges and spins a white cocoon within the molting web. In addition to the insects above mentioned, it is on record as attacking *Datana* and *Hyphantria,* making its usefulness all the more assured. This species was planted at several points in Connecticut in 1912 and 1913, to help control the brown-tail moth.

For a detailed account of this species see Bulletin No. 91, Bureau of Entomology, U. S. Department of Agriculture.

Microgaster Latreille.

Key to Species.

1. Propodeum with a more or less complete prominent median longitudinal carina, usually very coarsely rugose, never with an areola 2

Propodeum without a prominent median longitudinal carina, but with a more or less distinct median area or areola; second dorsal abdominal segment much shorter than third; basal joint of antennæ stramineous beneath; mouth stramineous, palpi whitish, wings hyaline; a stramineous band on middle of dorsum of abdomen; legs stramineous, hind tarsi dusky. Length of body 2.5 mm. ....**zonarius**

2. Second dorsal abdominal segment not separated from third by a deep transverse furrow, trilobed, rugose; mostly black with reddish legs; wings subhyaline............... 3

Second dorsal abdominal segment separated from third by a deep transverse furrow, the former segment not trilobed; mesopleural furrow wanting or shallow and smooth..... 4

3. Abdomen black above. Length 4 mm. ....**brevicaudus**

Abdomen mostly black; body 3 mm. long; lateral edge of first and second dorsal abdominal segments, yellow; third and fourth dorsal segments partly reddish stramineous; ventral portion of abdomen mostly reddish to yellowish stramineous ....**solidaginis**

4. Black; fore and mid legs, except coxæ, almost entirely stramineous, all coxæ black............................ 5

Black; antennæ brown; legs nearly as in *congregatiformis* and *carinatus*, but in addition the coxæ and trochanters are stramineous; hind femora not brown at apex, hind tibiæ reddish stramineous, brown at apex; ventral portion of abdomen mostly brownish stramineous. Length 4 mm. **gelechiæ**

5. Fore and mid proximal trochanters more or less blackish.. 6

Fore and mid proximal trochanters entirely stramineous or reddish; second dorsal abdominal segment nearly as long as first; lateral edge of first, second, third, and fourth segments more or less brownish stramineous, ventral portion of abdomen mostly reddish; trochanters, femora, tibiæ and tarsi mostly stramineous or reddish; hind femora and tibiæ brown at apex; hind tarsi brown. Length 3 mm..... **brittoni**

6. Basal half of abdomen yellowish beneath; third dorsal abdominal segment partly indistinctly punctate ....**carinatus**

Basal half of abdomen blackish beneath; third dorsal abdominal segment partly longitudinally striate ....**congregatiformis**

°**M. (Hypomicrogaster) zonarius** Say.

°**M. (Diolcogaster) brevicaudus** Provancher.

***M. (D.) solidaginis** Viereck (new species).

Type locality: Stafford, 24 August, 1905, on flowers of goldenrod (W. E. B.).

M. (Microgaster) carinatus Packard.

This is an American parasite of the cosmopolitan butterfly, (*Pyrameis*) *Vanessa atalanta*.

***M. (M.) brittoni** Viereck (new species).

Type locality: Kent, 31 August, 1904 (W. E. B.).

***M. (M.) congregatiformis** Viereck (new species).

Type locality: New Haven, 1 August, 1904, 24 May, 1905 (W. E. B., P. L. B.).

***M. (M.) gelechiæ** Riley.

Parasitic on *Gnorimoschema gallæsolidaginis*. New Haven, 27 July, 1904 (P. L. B.).

°**M.** sp.

Parasitic upon (*Pyrameis*) *Vanessa huntera*.

Microplitis Foerster.

Key to Species.

1. Clypeus blackish or black 2

Clypeus, antennæ and mandibles reddish, palpi light yellow; tegulæ and legs (except tarsi and hind coxæ, which are fuscous) stramineous; anterior half of abdomen, except dorsum of first segment, stramineous; wings hyaline, areolet subrhomboidal. Length 3.5 mm. ....**maturus**

2. First dorsal abdominal plate wider or at least not narrower at apex than at base 3

First dorsal abdominal plate narrower at apex than at base, and at least three times as long down the middle as wide at apex 7

3. First dorsal abdominal plate a little longer down the middle than wide at apex, but always less than twice as long; propodeum with a distinct median longitudinal carina ... 4

First dorsal abdominal plate at least twice as long down the middle as wide at apex, parallel-sided, and black; antennæ, mandibles and labrum reddish brown; palpi, legs, and more or less of under side of abdomen, together with a portion of the margins of first and second dorsal abdominal segments, reddish; claws blackish; tegulæ reddish to stramineous; wings hyaline, areolet quadrate. Length 3 mm. .... mamestræ

4. Fore and mid coxæ at least mostly stramineous............ 5
Fore and mid coxæ as well as hind coxæ mostly black or blackish; tegulæ stramineous; first dorsal abdominal plate finely sculptured; color of legs and length as in *Microgaster brittoni* .... waldeni

5. Hind coxæ stramineous or yellowish beneath.............. 6
Hind coxæ black or blackish beneath. Length 3.5 mm...actuosus

6. Scape blackish; length 2.5 mm.; body mostly black; antennæ, labrum, and mandibles blackish, palpi whitish; legs reddish, coxæ, except at apex, hind metatarsus, and all claws blackish; tegulæ stramineous; wings subhyaline, areolet quadrate .... ceratomiæ
Scape yellowish .... hyphantriæ

7. Tegulæ and coxæ mostly black or blackish................. 8
Tegulæ and coxæ mostly or at least partly reddish, stramineous or yellow; scape yellowish; second dorsal abdominal segment not rugose; body mostly black; first dorsal abdominal segment laterally, and first, second, and third ventral segments, and second and third dorsal abdominal segments mostly yellowish or stramineous; antennæ brown; legs stramineous to brownish, except hind tarsi, which are dark brown. Length 3 mm. .... varicolor

8. Stigma entirely blackish; legs colored as in *Microgaster brittoni*. Length 2.5 mm. .... quintilis
Stigma only partly blackish, the greater part of basal half stramineous; legs, except coxæ, which are black, and trochanters, tarsi, great part of basal half of mid and hind femora, which are brown, stramineous. Length 2.5 mm. melianæ var.

M. maturus Weed.

°**M. ceratomiæ** Riley.

Parasitizes the larva of the four-horned sphinx (*Ceratomia amyntor* = *C. quadricornis*) which feeds upon the elm. It is also on record as a parasite of a Smerinthid larva. The cocoons are as in *actuosus* but ribbed.

°**M. mamestræ** Weed.

Parasitic upon the painted mamestra (*Mamestra picta*), the larva of which is especially destructive to cabbages and beets, though it eats a great many other plants. The cocoons are reddish brown and ribbed.

***M. waldeni** Viereck (new species).

Type locality: New Haven, 23 June, 1905 (B. H. W.).

***M. quintilis** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.).

°**M. actuosus** Riley.

Reared from *Ceratomia amyntor*. Cocoons in masses, without ribs, and arranged like the cells in a honeycomb.

M. hyphantriæ Ashmead.

Reared from *Hyphantria cunea* and from a Noctuid larva on apple leaves; the former record is by Prof. S. A. Forbes, the latter by Dr. George Dimmock.

***M. varicolor** Viereck (new species).

Type locality: Putnam, 12 July, 1905 (H. L. V.).

M. melianæ Viereck, var.

The typical form of this species has been reared from the fifth-stage caterpillar of *Meliana albilinea* by Mr. R. L. Webster at Ames, Iowa.

West Haven, 27 June, 1905 (H. L. V.).

°**M.** Sp.

A parasite of the army worm, (*Leucania, Heliophila*) *Cirphis unipuncta*.

Microbracon Ashmead.

Key to Species.

1. Abdomen not sculptured or virtually sculptureless, second segment without furrows; dorsulum at least partly black; propodeum without a median longitudinal carina or sculpture from base to middle or beyond 2
Abdomen more or less sculptured 3
2. Dorsulum entirely black, all femora more or less black or blackish, hind femora with apical half stramineous **wawequa**
Dorsulum partly reddish ....**sebequanash**
3. Abdominal sculpture not confined to first, second, and third dorsal segments 4
Abdominal sculpture confined to first and second dorsal segments 20
4. Propodeum sculptured or carinate from base to apex 5
Propodeum neither sculptured nor carinate from base to apex 9
5. Propodeum sculptured all over 6
Propodeum not sculptured all over, but with a carina or sculpture from base to middle or beyond; fifth dorsal abdom-

inal segment granular or lineolate, dorsal segments finely granular, not thickened or leathery; apical half of abdomen mostly brown; head blackish above; body mostly reddish stramineous 8

6. Mesopleuræ not sculptured throughout 7
Mesopleuræ sculptured throughout ....**quinnipiacorum**

7. Depressed portion of mesopleuræ or episternauli not sculptured; abdomen yellowish throughout beyond second segment; scape black above ....**podunkorum**
Depressed portion of mesopleuræ or episternauli sculptured; scape not at all black ....**nawaasorum**

8. Dorsulum not blackish, but reddish like rest of thorax **konkapoti**
Dorsulum blackish; body mostly reddish ....**scanticorum**

9. Second dorsal abdominal segment without a dark or blackish mark at base and without a coarsely wrinkled basal median area; abdomen entirely pale, at least beyond first segment; fifth and sixth segments granular or lineolate, dorsal segments not leathery 10
Second dorsal abdominal segment with a dark or blackish mark at base 13

10. Abdomen not entirely pale, at least first dorsal plate more or less black 11
Abdomen entirely pale; propodeum in female with a carina or sculpture from base to the middle or beyond, in male without a carina or sculpture to middle **dorsator** var. **mellitor**

11. Thorax entirely black; propodeum without a carina or sculpture from base to middle 12
Thorax not entirely black; propodeum in female with a carina or sculpture from base to middle or beyond, in male without a carina or sculpture to middle..................**dorsator**

12. Head entirely black; fore and mid coxæ black ...**connecticutorum**
Head not entirely black; fore and mid coxæ reddish brown **massasoit**

13. Apical half of abdomen entirely or mostly pale, stramineous or yellowish 14
Apical half of abdomen mostly brown or blackish......... 15

14. Propodeum without a carina or sculpture from base to middle ....**montowesei**
Propodeum with a carina or sculpture from base to middle or beyond ....**dorsator** var. **lixi**

15. Dorsulum not entirely black; scape blackish............. 16
Dorsulum entirely black 18

16. Propodeum with a carina or sculpture from base to middle or beyond 17

Propodeum without a carina or sculpture to middle; third dorsal abdominal segment yellowish at base and down the middle .... **dorsator var. variabilis**

17. Thorax mostly stramineous .... **dorsator**

Thorax mostly black .... **dorsator var. æqualis**

18. Second dorsal abdominal segment apparently three times as wide at apex as long down the middle 19

Second dorsal abdominal segment apparently only twice as wide at apex as long down the middle; propodeum with a median carina or sculpture from base to middle or beyond .... **canadensis**

19. Abdomen delicately sculptured; mesopleuræ partly reddish brown 20

Abdomen coarsely sculptured, second segment mostly black; mesopleuræ black; propodeum with a carina or sculpture from base to middle or beyond .... **metacomet**

20. Propodeum with a carina or sculpture from base to middle or beyond .... **hobomok**

Propodeum without a carina or sculpture from base to middle .... **montowesei**

21. Femora mostly stramineous; propodeum without a carina or sculpture from base to apex; first dorsal abdominal segment black, except membranous part of first segment, which is pale 22

Femora mostly black or blackish, apical half of fore femora and fore tibiæ beneath stramineous; body mostly black; propodeum without a carina or sculpture from base to middle; abdomen more or less pale, fifth and following segments dark, blackish or dark brown; mouth pale, palpi black or blackish .... **vernoniæ**

22. Abdomen mostly reddish yellow above; propodeum with a carina or sculpture from apex to middle or beyond. . **gastroideæ**

Abdomen almost entirely black above; propodeum with a carina or sculpture from apex to middle or beyond ..... **uncas**

***M. wawequa** Viereck (new species).

Head and thorax black; length less than 4 mm.; first dorsal abdominal segment black or mostly black; second, third and fourth dorsal abdominal segments mostly brown, remainder of dorsum of abdomen mostly black.

Type locality: New Haven, 27 June, 1905 (H. L. V.).

***M. sebequanash** Viereck (new species).

Body mostly brown; head and thorax blackish above; length 2 mm.; exserted portion of ovipositor about one-half the length of the abdomen.

Type locality: New Haven, 6 July, 1904 (H. L. V.).

***M. quinnipiacorum** Viereck (new species).

Black color of abdomen confined to the first dorsal segment; head and thorax above partly black, mostly brown; abdomen pale brown.

Type locality: New Haven, 6 July, 1904 (H. L. V.).

***M. podunkorum** Viereck (new species).

Type locality: New Haven, 16 October, 1903 (H. L. V.).

***M. nawaasorum** Viereck (new species).

Head and thorax above mostly brownish stramineous. Type locality: Branford, 25 July, 1905 (B. H. W.).

***M. konkapoti** Viereck (new species).

Head mostly black, thorax mostly stramineous tinted with brown; abdomen mostly pale brown; legs mostly stramineous except hind femora, which are whitish on the basal half and dusky on the apical half; palpi whitish. Length 2.5-3 mm.

Type locality: West Thompson, 12 July, 1905 (H. L. V.).

***M. scanticorum** Viereck (new species).

Head and thorax above mostly blackish.

Type locality: West Thompson, 12 July, 1905 (H. L. V.).

°**M. dorsator** (Say). *Bracon xanthostigmus* Cresson.

M. dorsator var. **mellitor** (Say).

Length of body 2-3 mm.; ovipositor with exserted portion about as long as the abdomen; stigma yellowish to brownish or cloudy yellowish or fuscous.

This is an abundant variety, and occurs throughout the state in June, July and August. It is recorded as a parasite of the lesser peach-borer, (*Sesia*) *Synanthedon pictipes,* and is parasitic on *Sanninoidea exitiosa.*

°**M. dorsator** var. **lixi** (Ashmead).

°**M. dorsator** var. **variabilis** (Provancher).

M. dorsator var. **æqualis** (Provancher).

New Haven, 24 May, 1905 (W. E. B.); West Haven, 27 June, 1905 (H. L. V.).

***M. massasoit** Viereck (new species).

Length less than 4 mm.; head and thorax black; abdomen almost entirely black.

Type locality: Colebrook, 21 July, 1905 (H. L. V.).

°**M. canadensis** (Ashmead). *Opius canadensis* Ashmead.

***M. metacomet** Viereck (new species).

Female: length 3.5 mm.; face, mouth, malar space, lower part of cheeks, nearly all of fore legs, hind coxæ, trochanters, femora and most of tibiæ, stramineous.

Type locality: New Canaan, 29 September, 1909.

***M. hobomok** Viereck (new species).

Head mostly brownish stramineous; thorax black above.

Type locality: Branford, 28 July, 1905 (H. L. V.).

°**M. vernoniæ** Ashmead.

Head and thorax black; plate of first dorsal abdominal segment, a spot at base of second medially, and ovipositor, black, second segment mostly stramineous like the third laterally, rest of abdomen mostly blackish; all tarsi and the hind tibiæ toward tips, dusky; body 3 mm. long; exserted portion of ovipositor 2 mm. long.

Hosts: *Platynota sentana* and *Eudemis botrana* in seeds of *Vernonia noveboracensis*.

°**M. gastroideæ** Ashmead.

Head and thorax black; length less than 4 mm.; first dorsal abdominal segment black or mostly black; abdomen with its lateral margins yellow; a black blotch at base of second segment; palpi and antennæ black; legs yellowish red, tips of hind tibiæ and tarsi dusky; length 3 mm.

Host: *Gastroidea cyanea,* a species of beetle that is represented in the collection of the New Haven Experiment Station.

***M. uncas** Viereck (new species).

Abdomen uniformly black above and polished.

Type locality: New Haven, 15 May, 1905 (B. H. W,).

***M. montowesei** Viereck (new species).

Female: abdomen with dorsum yellow except most of first segment and part of the second, which are blackish or dark brown; body 3 mm. long; ovipositor with its exserted portion about one-half the length of the abdomen.

Male: abdomen dark brown except lateral margins of first dorsal segment and sutures between the first, second and third segments, all of which are pale; body 2.5 mm. long; legs mostly stramineous.

Type locality: New Haven, 14 May, 1906, 6 July, 1904 (B. H. W.). Bred from the immature stages of a host in connection with the rearing of *Priophorus acericaulis,* which causes maple stems to be detached from trees prematurely.

***M. connecticutorum** Viereck (new species).

Color nearly as in *Habrobracon gelechiæ,* but pale portion of abdomen brownish, the brownish color of abdomen occupying all the dorsum excepting most of first segment and a longitudinal blackish streak down the middle from the apex of second segment to near the apex of the abdomen.

Type locality: New Haven, 6 July, 1904 (H. L. V.).

Habrobracon (Ashmead) W. J. Johnson.

H. gelechiæ (Ashmead).

Length 2-3 mm.; head and thorax mostly black; antennæ comparatively slender, the second joint of the flagel at least twice as long as thick, head with a yellowish or yellow margin along the upper and inner eye margins, mandibles yellow with dark tips; coxæ more or less black with brownish or stramineous tips, sometimes with the apical half of the hind pair brownish, hind femora mostly stramineous or brownish stramineous; abdomen mostly densely sculptured and dull, the first dorsal plate in the female not parallel-sided and distinctly wider at apex than at base, in the male hardly wider at apex than at base and parallel-sided; second dorsal segment without furrows; membranous portion of first dorsal segment yellowish; rest of dorsum black in the female, in the male blackish with the second segment entirely yellowish, or yellowish with a blackish stripe down the middle, and the third segment more or less yellowish.

This species is on record as a parasite of (*Gelechia*) *Phthorimæa cinerella,* and the American tent-caterpillar (*Malacosoma americana*), and has been collected in West Haven, 27 June, 1905, West Thompson, 12 July, 1905, and Colebrook, 21 July 1905 (H. L. V.).

Iphiaulax Foerster.

Subgenus **Monogonogastra** Viereck.

Head, thorax and propodeum black; abdomen reddish or red, elliptical, not longitudinally striate, the second dorsal segment sculptured with a basal median embossed area, the third dorsal segment without a median area or keel, the furrows between the second and third and between the third and fourth dorsal segments crenulate, the second to fourth dorsal segments much wider than long down the middle, the third dorsal segment without a punctate transverse subapical line.

Key to Species.

1. Abdomen mostly smooth and polished 2
Abdomen mostly rugoso-punctate, exserted portion of ovipositor shorter than abdomen .... **augustus**
2. Ultimate and penultimate joints of maxillary palpi stramineous; exserted portion of ovipositor longer than abdomen **eurygaster**
Ultimate and penultimate joints of maxillary palpi black; exserted portion of ovipositor shorter than abdomen .... **agrili**

°I. (M.) **agrili** (Ashmead). *Bracon agrili* Ashmead.

I. (M.) **eurygaster** Brullé. Howard, Insect Book, Pl. viii, Fig. 33. Parasitic on an unknown longicorn beetle taken in South Woodstock. Has been taken in and around New Haven in June, July and August.

*I. (M.) **augustus** Viereck (new species.)

Type locality: North Haven, 13 August, 1905 (H. L. V.).

Cœloides Wesmael.

C. **pissodis** Ashmead.

First dorsal abdominal segment yellowish red, as is the remainder of the abdomen; length 3.2 mm.; ovipositor with its exserted portion 2.6 mm. long.

Host: the white-pine weevil (*Pissodes strobi*), a very common beetle throughout the state, living also on Norway spruce.

Rainbow, 1911 (S. N. Spring).

°C. **scolytivorus** (Cresson).

Head and thorax mostly black; abdomen and legs almost entirely brownish stramineous; length 4 mm., exserted portion of ovipositor 5.5 mm. long.

Host: hickory bark-borer (*Scolytus caryæ*).

Atanycolus Foerster.

A. **simplex** (Cresson). Howard, Insect Book, Pl. ix, Fig. 11.

Length 11 mm.; exserted portion of ovipositor as long as the body; abdomen reddish, its second dorsal segment with a median embossed area not attaining the apex and the sides of which form a Y.

Wallingford, 15 June, 1913 (W. E. B.).

°**A. charus** (Riley).

Bred from *Chrysobothris femorata*.

ALYSIIDÆ.

The length and attachment of the mandibles in this group are something astonishing; when closed, their tips do not meet or overlap, as is the rule in almost all other Hymenoptera; when open, they are turned out somewhat like hands with the palms turned out and up. According to our present knowledge of the parasitology of this family, its attacks are confined almost exclusively to dipterous larvæ.

Key to Genera.

1. Fore wings with two submarginal cells, first transverse cubitus always present; eyes not hairy; postscutel without a more or less perfect spine; first abdominal segment longer than broad; first branch of marginal vein distinct; second submarginal cell remote from stigma 2

Fore wings with three submarginal cells or with only two, but then without a first transverse cubitus; winged or with imperfect wings 3

2. Abdomen linear, longer than head and thorax, slightly compressed only at apex in female; marginal vein forming a regular curve 4

Abdomen oblong or ovate, not longer than head and thorax **Dacnusa** p. 213

3. First submarginal cell separated from second 5

First submarginal cell confluent with second....**Synaldis** p. 214

4. Head extending above lateral ocelli; notauli not meeting posteriorly ....**Ericœlinius** p. 212

Head not extending above lateral ocelli; notauli meeting posteriorly ....**Cœlinidea** p. 212

5. First transverse cubital vein shorter than second branch of marginal vein 6

First transverse cubital vein as long as or longer than second branch of marginal vein; first submarginal cell separated from first discoidal; fourth joint of antennæ not longer than third; second abdominal segment smooth and without a transverse line; propodeum not carinate; furrow of mesopleura distinct, rugose or carinate; subdiscoidal vein arising from or near middle of second discoidal cell; stigma short, oblong, receiving marginal vein beyond its middle **Cratospila** p. 214

6. First submarginal cell separated from first discoidal........ 7
First submarginal cell confluent with first discoidal ...... **Aphaereta** p. 214

7. Fourth joint of antennæ not longer than third; submedian cell of hind wings half as long as median................ 8
Fourth joint of antennæ longer than third; submedian cell of hind wings less than half as long as median; marginal cell reaching to apex of wing ....**Asobara** p. 213

8. Stigma apparently wanting or absent, or else not thicker than costa ....**Aspilota** p. 213
Stigma elongate, attenuate, but still somewhat thicker than costa; marginal vein originating beyond base of stigma, the latter cuneiform ....**Pentapleura** p. 213

Cœlinidea Viereck.

Cœlinius Authors, not Nees.

°**C. meromyzæ** Forbes.

Length 5 mm. Female: black; greater part of lower half of antennæ more or less yellow, apical half mostly dark brown; palpi pale, mandibles partly pale; legs dark stramineous; wings transparent, sometimes yellowish, veins and stigma brownish stramineous; second and third dorsal abdominal segments and ventral aspect of first segment stramineous to brownish stramineous; fourth abdominal segment and segments beyond this one, compressed. Male: similar to the female, but the abdomen not at all compressed.

***C. occom** Viereck (new species).

Male: length 4 mm.; differs from the description of *meromyzæ* given above as follows: antennæ with the scape brown, pedicel paler, remainder dusky or blackish, palpi stramineous, mandibles very dark brown; hind tarsi dark brown; apical third of first and nearly all of second dorsal abdominal segments brownish, nearly all of venter blackish brown; propodeum without a median raised line or ridge.

Type locality: New Haven, 24 May, 1905 (W. E. B.).

Ericœlinius Viereck.

***E. mahackemoi** Viereck (new species).

Male: differs from the description of *Cœlinidea occom* given above as follows: mandibles partly yellowish brown, dorsum of abdomen with the first segment black, succeeding segments more or less dark brown; propodeum with a median raised line or ridge.

Type locality: Branford, 24 August, 1904 (P. L. B.).

Dacnusa Haliday.

*__D. sachemella__ Viereck (new species).

Female: length 2 mm.; black; labrum and mandibles yellowish, palpi stramineous, scape and pedicel pale brown in front, rest of antennæ dusky or black; legs stramineous, tarsi more or less dusky, tegulæ dark brown; wings transparent, with a yellowish brown cast, stigma and veins brown; propodeum posteriorly with a median longitudinal fovea of an oblong, rounded shape and at least twice as long as wide; propodeum and first dorsal abdominal segment rugose or rugulose; ovipositor scarcely exserted.

Type locality: West Haven, 27 June, 1905 (H. L. V.).

Pentapleura Foerster.

*__P. foveolata__ Viereck (new species).

Male: length 1.5 - 2 mm.; black; mandibles dark brown; palpi blackish stramineous, antennæ mostly blackish; legs stramineous; wings with a brownish tinge, transparent, stigma and veins brownish stramineous; mesonotum with an almost circular fovea posteriorly; propodeum above with a median longitudinal ridge or raised line and with a similar raised line on each side of the propodeum.

Type locality: New Haven, 21 October, 1903 (H. L. V.).

Aspilota Fœrster.

*__A. ephemera__ Viereck (new species).

Male: length 1 mm.; black; mandibles, palpi, scape, pedicel, legs, and first abdominal segment all more or less pale stramineous, flagel blackish; wings transparent, tinted with brownish, veins blackish stramineous; abdomen beyond first segment dark blackish brown.

Type locality: New Haven, 23 June, 1904 (H. L. V.).

Asobara Foerster.

*__A. lineata__ Viereck (new species).

Female: length 2 mm.; head and thorax mostly black, mandibles yellowish, margined with brown, palpi stramineous, scape and pedicel pale brownish stramineous, flagel pale brown at base, dark brown to blackish beyond; wings pale, with their veins pale stramineous; costa partly brownish stramineous; legs almost entirely stramineous; abdomen mostly blackish; exserted portion of ovipositor fully two-thirds the length of the abdomen; propodeum with a median raised line.

Type locality: Putnam, 12 July, 1905 (H. L. V.).

A paratype of this species in the U. S. National Museum is from Algonquin, Illinois, and labeled "Nason, Nos., 130, July 23, 1895, and 4792."

Aphæreta Foerster.

A. muscæ Ashmead.

In color this species agrees very well with the description of *Aspilota ephemera* given above, except that the thorax is mostly dark brown and the body is longer, i. e., nearly 2 mm. long or a little longer; exserted portion of ovipositor nearly as long as the abdomen.

Occurs throughout the state in July and August, and has been bred from the onion maggot by Mr. B. H. Walden.

Cratospila Foerster

°**C. ridibunda** Say. *C. rubicunda* Ashmead.

Length 4-6 mm.; mostly reddish; head black; antennæ and legs blackish, mandibles more or less brownish; palpi dark; wings deep brown; female with the exserted portion of the ovipositor as long as or nearly as long as the abdomen; male with its abdomen above tipped with blackish.

Synaldis Foerster.

Key to Species.

1. First abdominal segment pale yellowish.................. 2

First abdominal segment like remainder of abdomen, i. e., black; head and thorax black; length 2 mm.; palpi, scape, pedicel, mandibles, tegulæ, and legs, more or less stramineous or brownish stramineous, rest of antennæ brown to blackish; wings transparent, faintly tinted with a dark shade; sixth to tenth joints of flagel hardly longer than thick; veins and stigma brownish to stramineous; exserted portion of ovipositor nearly half the length of abdomen **incisa**

2. Thorax laterally and beneath mostly brownish; abdomen beyond pale segment dark brown; femora and tibiæ partly dark brown, otherwise colored much the same as *incisa;* nearly 1.5 mm. long; male with sixth to tenth joints of flagel at least as long as thick ....**pygmæa**

Head, thorax, and abdomen, except as already stated, practically entirely black; legs stramineous; otherwise colored about as in *pygmæa*; exserted portion of ovipositor fully two-thirds length of abdomen above or a little longer; length of body 1.5 mm. or a little longer (female) .... **quinnipiacorum**

S. incisa Gahan.

New Haven, 16 October, 1903 (H. L. V.).

***S. pygmæa** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.).

***S. quinnipiacorum** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.).

STEPHANIDÆ.

In this small family are some of the most curious of the Ichneumon flies or Ichneumonoidea. It seems to constitute a link between the superfamily to which it belongs and the preceding series of groups, or the Phytophaga.

Key to Genera.

Abdomen, at least in female, subsessile, its first segment not longer than the second; hind tarsi in female 5-jointed; hind wings with closed cells ....**Schlettererius** p. 215

Abdomen in both sexes petiolate, its first segment fully twice as long as the second; hind tarsi in female 3-jointed, in male 5-jointed; hind wings without closed cells .... **Stephanus** p. 216

Schlettererius Ashmead.

°**S. cinctipes** Cresson.

Length 14-19 mm.; mostly black; thorax partly pale in color; the following parts whitish or white: labrum, a narrow band at base of all tibiæ, and the apical third of the ovipositor and its sheaths, except extreme tip of each; remainder of the legs partly stramineous, partly reddish; wings pale fuscous toward tips and with an angular subhyaline band commencing at the base of the stigma, the apex of this band paler than the portion beneath the stigma; exserted portion of the ovipositor about twice as long as the body.

Stephanus Jurine.

Megischus Brullé.

°**S. rufipes** Say.

Length 5 mm.; black, with reddish legs, the hind tarsi, however, dusky; wings hyaline with a triangular fuscous maculation; exserted portion of the ovipositor as long as the abdomen.

BANCHIDÆ.

Banchus Fabricius.

Key to Species.

1. Species mostly black or yellow, or both.................... 2
   Species mostly reddish or almost entirely reddish; face, cheeks, tegulæ, tubercles, mark on mesopleuræ, scutel and legs, more or less tinged with yellow; wings more or less yellowish brown; apex of hind tibiæ brown; spine of scutel about as long as third joint of the antennæ, the latter mostly brown. Length 10 mm. ....**ferrugineus**
2. Species black and yellow; wings brownish yellowish; face yellow excepting two black marks fused together above antennæ and a median black line extending from antennæ to clypeus; antennæ dark brown; thorax black, ornamented with yellow; abdomen black, with transverse bands of yellow; fore and mid coxæ mostly yellow, hind coxæ yellow, brown, and black; rest of legs yellow or reddish and blackish; spine of scutel longer than width of one of the ocelli. Length 12 mm. ....**cressoni**
   Species almost entirely yellow; antennæ brown; vertex with an interrupted, blackish transverse line; hind tibiæ at tips and tarsi brownish; wings almost clear, but tinted with yellow; spine of scutel about as long as the eighth joint of antennæ. Length 9 mm. ....**pallescens**

°**B. (Cidaphurus) cressoni** Viereck.

B. (C.) pallescens Provancher.

Stafford, 24 August, 1905 (W. E. B.).

B. (C.) ferrugineus Provancher.

Torrington, 7 July, 1905 (W. E. B.); New Haven, 17 June, 1911 (A. B. C.).

BRACONIDÆ.

Key to Genera.

1. Clypeus not emarginate so as to form a semicircular opening with mandibles 2

Clypeus emarginate so as to form a semicircular opening with mandibles, occiput separated from vertex by a ridge or raised line; abdomen sessile or subsessile.............. 24

2. Abdomen above with more than two sutures, sutures distinct 3

Abdomen above without a suture or at most with two superficial sutures, concave beneath.......................... 19

3. Second submarginal cell large, quadrangular, or wanting.. 4

Second submarginal cell small, minute, often imperfect; notauli distinct; marginal cell not reaching apex of wing 16

4. Abdomen sessile or subsessile 5

Abdomen petiolate 13

5. Fore wings with three submarginal cells................ 6

Fore wings with two submarginal cells.................. 11

6. Anterior margin of marginal cell longer than stigma, marginal and second and third submarginal cells distinctly defined 7

Anterior margin of marginal cell not longer than stigma 10

7. Hind femora thickened, sometimes toothed; head subquadrate, vertex excavate, its fovea harboring the middle ocellus 8

Hind femora simple; head transverse, vertex not or scarcely excavate; middle ocellus not harbored by a fovea; abdomen linear, longer than thorax, inserted above hind coxæ **Macrocentrus** p. 219

8. Hind femora unarmed 9

Hind femora armed with a tooth beneath....**Helconidea** p. 220

9. Basal joint of hind tarsi not longer than second, third, and fourth joints combined ....**Helcon** p. 220

Basal joint of hind tarsi longer than second, third, and fourth joints combined ....**Eumacrocentrus** p. 220

10. First branch of marginal vein shorter than second; second submarginal cell longer than first ....**Ichneutes** p. 221

First branch of marginal vein hardly longer than second; second submarginal cell shorter than first....**Ichneutidea** p. 221

11. Anal cell of fore wings open at apex; marginal vein straight, its first branch long and distinct; ovipositor straight; first discoidal cell sessile, touching parastigma; cubital vein arising from base of stigma ....**Blacus** p. 222

Third discoidal cell of fore wings closed at apex............ 12

12. Abdomen elongate, its sides parallel, showing eight segments above, the first much longer than broad ....**Eubadizon** p. 221

Abdomen short, sides rounded, showing at most only three or four segments above, the rest retracted, first segment not or scarcely longer than its apical breadth ...... **Brachistes** p. 221

13. Fore wings with two submarginal cells or without submarginal cells 14

Fore wings with three submarginal cells......**Meteorus** p. 222

14. First submarginal and first discoidal cells not confluent but separated; antennæ not clavate nor geniculate 15

First submarginal and first discoidal cells confluent, marginal cell semicordate, ending about half-way between stigma and apex of wing or nearer to stigma; antennæ simple in both sexes .... **Perilitus** p. 226

15. Marginal cell semicordate, ending nearer to stigma than apex of wing, narrower than stigma, marginal vein curved throughout; with or without submarginal cells; propodeum more or less sloping behind; ovipositor concealed ...... **Euphorus** p. 224

Marginal cell sublanceolate, ending about half-way between stigma and apex of wing, broader than stigma; marginal vein straight near end, front wings with two distinct submarginal cells; propodeum vertically truncate behind; ovipositor exserted .... **Dinocampus** p. 225

16. Fore wings with three submarginal cells 17

Fore wings with two submarginal cells, first submarginal cell separated from first discoidal cell; mesopleuræ with a crenulate furrow; face not rostriform .... **Orgilus** p. 226

17. Face not rostriform 18

Face rostriform; first submarginal and first discoidal cells more or less confluent .... **Bracon** p. 230

18. First submarginal cell and first discoidal cells more or less confluent; mesopleuræ with a furrow; wings generally infumated .... **Bassus** p. 226

First submarginal cell separated from first discoidal cell; mesopleuræ without a furrow; wings hyaline.. **Earinus** p. 229

19. Fore wings with three submarginal cells 20

Fore wings with two submarginal cells 23

20. Abdomen with only one segment visible above.............. 21

Abdomen with three segments visible above 22

21. Eyes bare, first submarginal and first discoidal cell not confluent .... **Ascogaster** p. 231

Eyes hairy, first submarginal and first discoidal cell confluent **Chelonus** p. 232

22. Abdomen beneath with two teeth pointing backward; recurrent vein received by first submarginal cell, second submarginal cell not narrowed at base; mid tibiæ simple ..... **Sigalphus** p. 233

Abdomen beneath edentate; recurrent vein subobsolete, second submarginal cell much narrowed at base; mid tibiæ externally gibbous .... **Phanerotoma** p. 233

23. Abdomen above with only one segment visible .... **Urosigalphus** p. 233

Abdomen above with three segments visible .... **Triaspis** p. 234

24. Fore wings with three submarginal cells; head not cubical, more or less narrowed behind eyes 25

Fore wings with two submarginal cells; head cubical, or outside line of temples virtually in same plane as outside line of eyes; sutures between dorsal abdominal segments distinct 27

25. Subdiscoidal vein not interstitial with anal vein, originating below middle of discoidal vein; abdomen sessile, almost always rugose, except apex, small smooth impressions visible on second and third dorsal segments; ovipositor short or concealed 26

Subdiscoidal vein interstitial with anal vein, or originating above middle of discoidal vein; median and submedian cells of equal length or nearly of equal length on median vein; antennæ more than 12-jointed and much longer than head and thorax; suture between second and third segments superficial; recurrent vein received by second submarginal cell, which is much narrowed at base ....**Hormius** p. 236

26. Suture between second and third segment obsolete; second submarginal cell trapezoidal; abdomen not longer than head and thorax, in female subcompressed at apex, ovipositor considerably exserted ....**Epirhyssalus** p. 235

Suture between second and third segment distinct, crenulate; third joint of maxillary palpi not dilated, but simple; recurrent vein received by first submarginal cell; first branch of marginal vein shorter than second; second submarginal cell elongate, more than half length of first; fourth and following abdominal segments in female not retracted and concealed beneath third....**Aleiodes** p. 235

27. First and second submarginal cells distinct, not confluent; marginal cell closed.................................. 28

First and second submarginal cells confluent; abdomen above showing more than three segments; hind wings with a stigma ....**Heterospilus** p. 238

28. Abdomen sessile, with only four segments visible above; ovipositor hardly exserted; recurrent vein received by first submarginal cell, hind wings without a stigma ....
Polystenidea p. 238

Abdomen sessile, with at least six segments visible above; ovipositor elongate; recurrent vein interstitial; hind wings with a stigma ....**Hecabolus** p. 237

Macrocentrus Curtis.

Key to Species.

1. Species uniformly stramineous. Length 6-8 mm. 2

Head and thorax mostly black; antennæ brown, except first and second joints, which, like legs and venter of abdomen, are stramineous; dorsum of abdomen black, except third dorsal segment, which is nearly orange in color .... **pyraustæ**

2. Antennæ stramineous .... **uniformis**
Antennæ blackish or brownish .... **delicatus**

***M. pyraustæ** Viereck (new species).

Length 5 mm.; exserted portion of ovipositor 5.5 mm. long.

Type locality: Westville. Bred from a lot of material from which the fern leaf-roller (*Pyrausta theseusalis*) was reared, upon which it is probably parasitic. 14 July, 1900 (W. E. B.).

°**M. delicatus** Cresson.

This species has been bred from tortricid larvæ, and is an American parasite of the cosmopolitan codling moth (*Carpocapsa pomonella*).

°**M. ? uniformis** Provancher.

Helconidea Viereck.

Helcon Authors, not Nees.

Type: *Helcon æquator* Nees.

°**H. ligator** (Say). *Bracon ligator* Say. Howard, Insect Book, Pl. viii, Fig. 41 (*Helcon ligatus*).

Length 9 mm.; black; abdomen and legs rufous, tarsi blackish at tips; antennæ with a white annulus beyond the middle on the female; wings hyaline, veins fuscous; hind tibiæ fuscous, their tarsi whitish; exserted portion of ovipositor blackish.

Eumacrocentrus Ashmead.

°**E. americanus** (Cresson).

Length 14 mm.; mostly black, except the legs, which are reddish brown stramineous; exserted portion of ovipositor about three times the length of the body; antennæ about 12 mm. long.

Helcon Nees.

Gymnoscelus Foerster.

°**H. pedalis** (Cresson).

Length 12 mm.; antennæ about 8 mm. in length; exserted portion of ovipositor 10 mm. long; color approximately as in *Eumacrocentrus americanus,* except the femora, tibiæ and tarsi of the hind legs, which are all mostly blackish.

Ichneutes Nees.

°**I. fulvipes** Cresson.

Length 3.5 mm.; head and thorax almost entirely black; abdomen black and blackish red; legs, tubercles, tegulæ, and palpi stramineous; antennæ brown.

Ichneutidea Ashmead.

I. secunda Rohwer.

Length 3-4 mm.; colored to a great extent like *Cardiochiles viator* as described above (p. 183), except that the reddish color is replaced by stramineous.

New Haven, 30 July, 4 August, 1909 (B. H. W.).

Eubadizon Nees.

E. lithocolletidis Viereck.

Length 2 mm.; head, thorax, and abdomen stramineous tinged with brown; antennæ brownish; legs paler than the body except the apical joints of the tarsi, which are blackish; stigma stramineous; veins dark; exserted portion of the ovipositor as long as the abdomen or nearly as long.

West Hartford, 29 August, 1904 (H. L. V.).

E. americanus Cresson.

Length 4.5-5 mm.; black; shining; mandibles and palpi pale stramineous; antennæ brown-black; tegulæ and basal wing veins pale honey-yellow; wings faintly dusky; legs, including coxæ, honey-yellow; tarsi and hind tibiæ, except at base, blackish; exserted portion of ovipositor longer than the body.

Brachistes Wesmael.

Calyptus Authors, not Haliday.

B. tibiator (Cresson).

Length 2.5 mm.; black, shining; clypeus, except at base, and mandibles fulvous; palpi white; antennæ brown to black above, fulvo-stramineous beneath; tegulæ and veins at base of wings honey-yellow; wings hyaline; legs mostly pale luteous.

Parasitic on the strawberry weevil (*Anthonomus signatus*).

B. magdali (Cresson).

Length 3.5-5 mm.; black and shining; tegulæ, base of antennæ, palpi and legs stramineous; exserted portion of the ovipositor as long as the abdomen.

Parasitic on the weevil (*Magdalis olyra*).

Blacus Nees.

°**B. lactucaphis** (Fitch). *Aphidius lactucaphis* Fitch.

Male: length 1.5 mm.; castaneous and shining except as follows; mouth mostly stramineous, antennæ and legs mostly brownish; abdomen blackish apically; propodeum and first dorsal abdominal segment rugulose or reticulated.

Meteorus Haliday.

The species of this genus spin ovoid, brownish cocoons, from which the adult emerges at one end by pushing off a cap that sometimes remains attached as if by a hinge after the emergence of the imago; the opposite end is in some species provided with a long silken thread which serves to suspend the cocoon from a twig or some other support out of harm's way.

Key to Species.

1. First dorsal abdominal segment with a fossa on each side between spiracles and base of petiole; greatest diameter of lateral ocellus equal or very nearly equal to ocellocular line, or at least more than half as long as ocellocular line, ocelli large; dorsum of propodeum with only one kind of sculpture 2

First dorsal abdominal segment without a fossa on each side between spiracles and base of petiole 6

2. Lateral ocelli with greatest diameter not as long as ocellocular line 3

Lateral ocelli with greatest diameter as long as ocellocular line .... **indagator**

3. First dorsal abdominal segment striate down middle........ 4

First dorsal abdominal segment not striate down middle; stigma pale only at base .... **archipsidis**

4. Narrowest part of petiole nearly parallel-sided, without a prominent carina along its upper margin, and mostly blackish 5

Narrowest part of petiole not at all parallel-sided, with a prominent carina along its upper margin, and mostly pale **communis**

5. Postpetiole mostly pale; propodeum and scapulæ stramineous ....petiolariferus
Postpetiole black; propodeum and scapulæ blackish ....pretiosus
6. Greatest diameter of lateral ocelli distinctly shorter than ocellocular line 7
Greatest diameter of lateral ocelli at least as long as ocellocular line ....hyphantriæ
7. Postpetiole distinctly, closely striate 8
Postpetiole indistinctly striate, some of the striæ separated by broad polished spaces ....vulgaris
8. Body more or less black or blackish.......... 9
Body almost entirely reddish stramineous ....exareolatus
9. Petiole stramineous or brownish stramineous ....versicolor
Petiole black ....dimidiatus

M. indagator (Riley).

Length 4.5 mm.; propodeum black, as is the first abdominal segment; tarsi, especially at their tips, slightly dusky; exserted portion of ovipositor about as long as the abdomen.

A parasite bred from *Acrobasis* on barberry. New Haven, 27 June, 1913 (L. B. Ripley).

°**M. archipsidis** Viereck.

Parasitic on *Archips argyrospila.*

***M. communis** (Cresson).

Tibiæ and tarsi pale yellowish stramineous; propodeum with no basal area, but with a median longitudinal ridge on the basal half; exserted portion of ovipositor about half the length of the abdomen.

May be found throughout the state, where it has been taken in June, July and October (H. W. W., H. L. V.). Parasitizes the white-marked tussock moth (*Hemerocampa leucostigma*), *Pyrausta penitalis, Lithocolletis robiniella* and *Datana integerrima.*

***M. petiolariferus** Viereck (new species).

Male: propodeum with a median longitudinal carina on the basal half and a petiolarea on the apical half.

Type locality: Branford, 28 July, 1905 (H. L. V.).

***M. pretiosus** Viereck (new species).

In color like *communis* except vertex and scapulæ, which are stained with blackish; propodeum and petiole blackish; antennæ brown.

Type locality: Yalesville, where it was collected 19 October, 1903 (H. L. V.). Has also been taken in Cheshire, 8 July, 1904 (H. L. V.).

M. hyphantriæ Riley.

Tips of hind tibiæ dark; propodeum blackish.

This is a primary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*), also parasitic on the fall web worm. Occurs throughout the state from July to September inclusive (H. L. V.). (See Fig. 247, Smith's "Insects of New Jersey").

°**M. vulgaris** (Cresson).

Length 4 mm.; propodeum and basal segment of abdomen tinged with blackish, rest of abdomen brown; thorax reddish; head and antennæ brownish stramineous; legs stramineous; wings clear.

Recorded as a parasite on *Omphalocera cariosa* and *Tetralopha platanella*.

***M. exareolatus** Viereck (new species).

Male. Type locality: Rockville, taken 23 August, 1905 (H. L. V.).

°**M. versicolor** (Wesmael).

Parasitic on the brown-tail moth (*Euproctis chrysorrhœa*), and has been imported from Europe into the State of Massachusetts to combat this species.

M. dimidiatus (Cresson).

Head partly, thorax almost wholly black or blackish; basal and apical third of abdomen black or blackish; middle third of abdomen and legs usually mostly stramineous.

Specimens taken in Connecticut by the writer indicate that this species occurs throughout the state from June to August inclusive. It is recorded as a parasite of *Feltia subgothica*.

Euphorus Nees.

Key to Species.

Length 3 mm; black; face dull, pubescent with silvery hairs; clypeus and mandibles mostly reddish; greater part of legs pale stramineous; wings clear; abdomen partly brownish .... **mellipes**

Length 4 mm; black; head pale yellowish red; occiput and a spot enclosing ocelli black; antennæ entirely black; legs dull reddish, coxæ black, tips of hind tibiæ and more or less of hind tarsi dusky; wings faintly dusky, veins and stigma fuscous; abdomen rufo-piceous .... **sculptus**

E. mellipes Cresson. *Peristenus mellipes* Ashmead.
West Haven, 27 June, 1905 (H. L. V.).

°**E. sculptus** Cresson. *Dinocampus sculptus* Ashmead.
Parasitic on the adult of *Megilla fuscilabris*.

Dinocampus Foerster.

***D. pyri** Viereck (new species).

Length 3 mm.; head brownish stramineous, except face, which is yellowish; antennæ dark brown, scape, however, brownish stramineous in front; thorax black or blackish, prothorax brownish; tegulæ brownish, costa brown, stigma, radius, and greater part of transverse cubitus brownish stramineous, remaining veins pale, membrane of wings clear; propodeum rugose, with a short, median, longitudinal raised line on its basal fourth; in addition to this there is an imperfect areola, which is confluent with an equally imperfect petiolarea; legs stramineous, tinted with brown, apical tarsal joint and claws dark brown; petiole of abdomen black or blackish, color of the rest of the abdomen merging from blackish to brownish stramineous, exserted portion of ovipositor nearly half the length of the abdomen.

Type locality: New Haven, collected 26 May, 1904, on flowers of the chokeberry (*Pyrus arbutifolia*) (H. L. V.).

D. americanus Riley.

Length 3.5 mm.; black; antennæ dark, pedicel and first joint of flagel sometimes yellowish; head mostly fulvous; mid and hind coxæ black, remainder of legs mostly stramineous; wings hyaline, stigma dark brown, veins somewhat lighter; abdomen mostly dark fulvous to castaneous.

This species is parasitic upon the adults of two beneficial lady-bird beetles, namely, *Megilla fuscilabris* (*M. maculata*), the food of which includes pollen, fungus spores, plant lice, and other soft insects, and *Coccinella novemnotata*, the species reputed to be the most general feeder on plant lice of all kinds.

Perilitus Nees.

This genus may be found in this State.

Orgilus Haliday.

Key to Species.

Length 3 mm.; honey-yellow; disk of propodeum and interocellar area black; flagel dusky brownish; a spot at apex of hind femora, hind tibiæ except a white annulus at base, and hind tarsi, fuscous; wings hyaline, stigma and veins brown .... **kearfotti**

Length 4 mm.; black; scape brown in front, flagel very dark brown, mandibles brown, but paler than scape in front; fore and mid coxæ mostly brownish red, hind coxæ mostly black, tipped with brownish red; femora brownish red, apical half of hind pair mostly blackish; fore tibiæ concolorous with fore femora, mid tibiæ reddish brown, but with apical third dusky; hind tibiæ mostly dusky or blackish; tarsi more or less dusky, those of hind legs blackish; wings tinged with brown, costa blackish, remaining veins blackish stramineous, basal and median veins of front wings darker than the rest; abdomen with a reddish lateral margin to second dorsal segment and a basal reddish margin to third dorsal segment ...... **detectiformis**

°**O. kearfotti** Ashmead.

Bred from the moth *Recurvaria juniperella.*

***O. detectiformis** Viereck (new species).

Male: length 4 mm.

Type locality: Scotland, where the type was taken on 10 August, 1905 (B. H. W.). Paratype, West Thompson, 12 July, 1905 (H. L. V.).

Bassus Fabricius.

Microdus Authors, not Nees.

Key to Species.

1. Body almost entirely black. Length 3.5 mm. 2
Body not almost entirely black.......................... 3

2. First and second dorsal abdominal segments brownish; coxæ black; rest of fore and mid legs brownish stramineous; hind legs black, except a white annulus near base of their tibiæ and a wide white annulus in middle of same; exserted portion of ovipositor a little longer than abdomen **pyrifolii**

Abdomen above practically entirely black; legs stramineous except tibiæ and tarsi of hind pair, the former of which is mostly yellowish with two brown annuli, and the latter brown except base of first tarsal joint, which has a yellowish annulus; exserted portion of ovipositor nearly twice length of abdomen ....earinoides

3. Thorax mostly black 4

Thorax not mostly black but black and red; abdomen practically entirely reddish 11

4. Abdomen reddish 5

Abdomen not unicolorous 6

5. Length 3.5 mm.; legs black, except brownish articulations, and tarsi and hind femora, which are reddish (male) .... erythrogaster

Length 6 mm.; legs black; propodeum black; metapleuræ partly reddish; ovipositor much longer than body ..perforator

6. Head and legs mostly pale; wings fuscous.................. 7

Head mostly or entirely black; legs mostly pale........... 8

7. Length 4 mm.; exserted portion of ovipositor 4 mm. long; legs, except tarsi and hind tibiæ, mostly brownish, hind tibiæ with a dark brown annulus near their base and with their apical third dark brown; dorsum of abdomen black, except apical third of first and second segments, which is yellowish stramineous ....brittoni

Length 3.5 mm.; exserted portion of ovipositor 2 mm. long; legs as in *brittoni*, but pale parts yellowish stramineous and hind femora with all but middle third dark brown; dorsum of abdomen blackish, except second and fourth segments and apical fourth of abdomen, which are yellowish to brownish stramineous ....discolor

8. Legs as in *agilis*, as described in paragraph below, except as noted in paragraphs 9 and 10 9

Legs mostly reddish to yellowish stramineous, tarsi of middle and hind legs mostly brown, hind tibiæ brownish stramineous, but with apical fourth brown and with a brown annulus near their bases; wings pale yellowish; dorsum of abdomen reddish, except apical third, which is black; length 5.5 mm; exserted portion of ovipositor .5 mm. long ....agilis

9. Legs colored nearly as in *annulipes*........................ 10

Tarsi of middle legs stramineous; wings pale brownish; abdomen with basal third dark reddish brown or blackish, its middle third brownish stramineous, its apical third blackish; length 4 mm.; exserted portion of ovipositor 4 mm. long ....annulipes

10. Wings nearly as in *annulipes;* dorsum of abdomen blackish, except second segment, which is reddish brown; length 4 mm.; exserted portion of ovipositor 3 mm. long .. winkleyi

Wings pale, tinged with blackish; dorsum of abdomen with its basal fourth blackish, as is apical half of succeeding portion, rest brownish stramineous; length of body and ovipositor as in *annulipes* as stated above ....**waldeni**

11. Propodeum reddish 12

Propodeum black; reddish color of thorax confined to metapleuræ; legs mostly black, except hind coxæ and femora which are red; wings fuscous. Length 5 mm. (male).... **rugareolatus**

12. Reddish color of thorax confined to metapleuræ............ 13

Reddish color of thorax not confined to metapleuræ.......... 14

13. Hind legs as in *rugareolatus*, except tibiæ and tarsi, which are brown; wings fuscous; length 10 mm.; exserted portion of ovipositor as long as body ....**sanctus**

Hind legs reddish, except tibiæ and tarsi, which are brown; wings fuscous; length 6 mm.; exserted portion of ovipositor 5 mm. long ....**simillimus**

14. Thorax mostly reddish; legs dark brown, except hind coxæ and femora, which are reddish; wings fuscous; length 8.5 mm.; exserted portion of ovipositor 11 mm. long ....**imitatus**

Thorax reddish, except dorsulum, which is black, and scutel and propleuræ, which are blackish; legs mostly black, hind coxæ reddish, their femora mostly brown; wings fuscous; length 4 mm.; exserted portion of ovipositor 5 mm. long **buttricki**

B. (**Euagathis?**) **sanctus** Say. Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 10.

There are at least two hosts of this species, as follows: the skipper (*Nisoniades*) *Thanaos juvenalis*, the larvæ of which feed on wild beans and other legumes and on oak; and another skipper, *Pholisora catullus*, the larvæ of which are known to devour goosefoot or pigweed (*Chenopodium*) and amaranth (*Amarantus*).

New Haven, 28 June, 1902 (E. J. S. M.).

B. (**Bassus**) **discolor** Cresson.

Branford, 22 August, 1904 (H. W. W.).

B. (B.) **agilis** Cresson.

Has been bred from the larva of *Pyrausta theseusalis, P. futilalis, Aristotelia absconditella, Archips rileyana, and* A. *infumatana.*

West Haven, 27 June, 1905 (H. L. V.); Branford, 29 July, 1904 (P. L. B.).

***B. (B.) brittoni** Viereck (new species).

Type locality: New Haven, 23 August, 1906 (W. E. B.).

***B. (B.) pyrifolii** Viereck (new species).

Type locality: New Haven, where the type was collected on pear leaves, 27 June, 1905 (H. L. V.).

°**B. (B.) simillimus** Cresson.

On record as a parasite of *Eucosma strenuana* and *Lixus scrobicollis*.

°**B. (B.) imitatus** Cresson.

°**B. (B.) earinoides** Cresson.

On record as a parasite of *Tmetocera ocellana, Coleophora cinerella?*, and *Exartema malanum*.

°**B. (B.) perforator** (Provancher). *Agathis perforator* Provancher.

B. (B.) annulipes Cresson.

Branford, 22 August, 1904 (H. W. W.); var., Sachem's Head, 1 August, 1904, on flowers of parsnip (*Pastinaca sativa*) (H. L. V.).

***B. (B.) winkleyi** Viereck (new species).

Type locality: Scotland, 10 August, 1905 (B. H. W.).

***B. (B.) waldeni** Viereck (new species).

Type locality: Scotland, 10 August, 1905 (B. H. W.).

***B. (Lytopylus) buttricki** Viereck (new species).

New Haven, 16 August, 1904 (P. L. B.).

***B. (L.) erythrogaster** Viereck. *Ærophilopsis*.

Stafford, 24 August, 1905, on flowers of goldenrod (W. E. B.).

***B. (L.) rugareolatus** Viereck (new species).

Type locality: New Haven, taken 12 September, 1904 (B. H. W.).

Earinus Wesmael.

°**E. limitaris** Say.

Length 7.5 mm.; black, with legs mostly reddish stramineous; hind tarsi brown, their tibiæ with the apical half brown, the basal half mostly yellowish, with a brown annulus; wings pale, with a brownish tinge; exserted portion of ovipositor as long as the abdomen.

Bracon Panzer.

Key to Species.

1. Wings with a triangular areolet 2

Wings with a quadrangular areolet 4

2. Reddish; wings fuscous; front vertex and occiput mostly black 3

Black; fore and mid femora partly, their tibiæ and their tarsi wholly, brownish stramineous; hind femora brownish stramineous at tip, their tibiæ dark brown, with the exception of nearly all of the basal two-thirds, which is brownish stramineous except for brownish annulus near the base; wings fuscous. Length 2 mm. (male).... **solidaginis**

3. Legs blackish, hind coxæ partly reddish, their femora reddish, blackish at base; dorsum of thorax stained with black; length 3 mm. (male and female); exserted portion of ovipositor 3 mm. long .... **sassacus**

Fore and mid legs blackish, except coxæ, which are reddish, and femora, which are partly brownish stramineous; hind legs reddish, except tibiæ and tarsi, which are dark; dorsum of thorax reddish throughout (male) .... **branfordensis**

4. Thorax black or red, or black with metapleuræ and propodeum partly red 5

Thorax black and red; black or blackish, except metapleuræ and propodeum, hind legs (with exception of trochanters, base and apex of tibiæ, and all tarsi, which are black or blackish) and abdomen, all of which are red or reddish; wings fuscus; length 1 mm; exserted portion of ovipositor 3 mm. long .... **semirubra**

5. Thorax red; abdomen red; prosternum, fore and mid coxæ and trochanters, fore and mid femora at base, hind femora at apex, their tibiæ at base and apical half, and the hind tarsi, black or blackish; rest of hind tibiæ brown; wings fuscous; length 7 mm.; exserted portion of ovipositor 3.5 mm. long .... **hæmatodes**

Thorax black, or with metapleuræ and propodeum partly red 6

6. Abdomen black, except a reddish mark on each side of first segment; exserted portion of ovipositor more than 4 mm. long; legs more or less blackish yellow; wings blackish, with a rudimentary hyaline band in middle; length 4 mm.; thorax black .... **tibiator**

Abdomen red; propodeum partly reddish; wings blackish; fore and mid legs black; hind legs reddish, with trochanters, bases and apices of tibiæ and tarsi black; exserted portion of ovipositor shorter than the body, which is 7.5 mm. long .... **liberator**

***B. (Agathis) sassacus** Viereck (new species).

Visits flowers of goldenrod. Type locality: Stafford, 24 August, 1905 (W. E. B.). Another locality: Westbrook, 30 August, 1904 (H. L. V.).

***B. (A.) solidaginis** Viereck (new species).

Type locality: Stafford, 24 August, 1905, on flowers of goldenrod (W. E. B.).

***B. (A.) branfordensis** Viereck (new species).

Type locality: Branford, 16 September, 1904 (H. W. W.).

°**B. (Bracon) hæmatodes** Brullé.

°**B. (B.) tibiator** Provancher.

°**B. (B.) liberator** Brullé.

B. (B.) semirubra Brullé.

East Hartford, 9 August, 1904 (P. L. B.).

Ascogaster Wesmael.

Key to Species.

1. First discoidal cell of fore wings sessile.................... 2
First discoidal cell of front wings petiolate.................. 3

2. Black; antennæ black at apex, red at base; wings hyaline, more or less obscure in middle; legs red, with apex of hind femora, apex of hind tibiæ and tarsi black; abdomen with a reddish mark at base above, venter reddish to stramineous. Length 4 mm. ....**provancheri**

3. Black; antennæ and legs mostly yellow; mouth stramineous, clypeus apically reddish, palpi whitish; wings transparent, tinted with brown, stigma and veins brown; hind femora and tibiæ with apical third of former and apical half of latter brown, hind tarsi brown. Length 3.5 mm. ....
provancheri var. pallidicornis

Black; antennæ mostly brown, scape stramineous; legs mostly black; mandibles mostly stramineous, clypeus black; palpi blackish; propodeum with four prominent angular projections; wings transparent tinged with brown ......**carpocapsæ**

°**A. provancheri** Dalla Torre.

***A. provancheri var. pallidicornis** Viereck (new variety).

Type locality: Connecticut. Probably collected at Farmington by Norton.

°**A. carpocapsæ** (Viereck).

Parasitic on the codling moth (*Carpocapsa pomonella*).

Chelonus Jurine.

Mostly black in color.

Key to Species.

1. Abdomen above entirely black, except pubescence, which is silvery 2
Abdomen above not entirely black.......................... 5
2. Length 5 mm. or less 3
Length 7 mm.; mandibles mostly brownish, palpi brown; most of fore and mid femora, nearly all of their tibiæ and tarsi, greater part of hind metatarsi, and basal two-thirds of hind tibiæ, brownish stramineous ....**sericeus**
3. Hind femora not mostly black 4
Hind femora entirely or almost entirely black; fore and mid femora partly blackish, tipped with brownish yellow, fore and mid tibiæ brownish stramineous, hind tibiæ with basal and apical third mostly dusky, middle third mostly yellowish with an admixture of brown. Length 3.5 mm. **fissus**
4. Base of antennæ pale yellow; legs pale yellow, except tips of tarsi, which are dusky; mandibles yellowish; palpi white; wings hyaline, pale yellowish at base, veins fuscous..**basilaris**
Antennæ black throughout, mandibles castaneous tipped with dusky, palpi dark brown; wings smoky, blackish at base, veins black; femora and tibiæ mostly reddish, except as follows: mid and hind tibiæ and hind femora each with apical third or more dusky; coxæ, trochanters and tarsi blackish. Length 4-5 mm. (female) ....**sassacus**
5. Abdomen with two yellow areas at base above............ 6
Abdomen with a pale yellow band occupying basal third of its dorsum; length 3 mm.; palpi yellow; wings hyaline, stigma black; fore and mid legs stramineous, with their tarsi brownish black; hind legs black; trochanters, femora at base, and an annulus on their tibiæ, stramineous; abdomen with two longitudinal carinæ on basal third of dorsum .... **basicinctus**
6. Palpi dark brown or blackish; legs colored practically as in *sassacus* except tarsi, which are mostly brownish to dusky with hind metatarsi yellowish tipped with brown. Length 3-4 mm. (female) ....**konkaputus**
Palpi stramineous, pale; legs practically as in preceding species except second joint of hind tarsi, which is mostly yellowish and tipped with a brown annulus, as are hind metatarsi; abdomen with a maroon-colored dot on each side of apical fifth of its carapace-like shield (male) ...... **mysticorum**

°C. (**Chelonus**) **sericeus** (Say).

*C. (C.) **konkaputus** Viereck (new species).

Type locality: New Haven, 4, 6 July, 1904.

*C. (C.) **sassacus** Viereck (new species).

Type locality: Woodmont, 9 July, 1904 (P. L. B.).

°C. (C.?) **basilaris** Say.

C. (**Chelonella**) **fissus** Provancher.

Stafford, 24 August, 1905, on flowers of goldenrod; Westville, 4 July, 1904 (W. E. B.); New Haven, 20 July, 1904 (B. H. W.).

°C. (C.) **basicinctus** Provancher.

*C. **mysticorum** Viereck (new species).

Type locality: New Haven, 20 July, 1905 (B. H. W.).

Sigalphus Latreille.

Sphæropyx Illiger.

S. **bicolor** (Cresson). *Phanerotoma bicolor* Cresson.

Length 6.5-7 mm.; black; wings strongly brownish; propodeum stramineous, red or black; abdomen red and with two distinct parallel carinæ on its first dorsal segment; propodeum also with two distinct parallel carinæ.

Mt. Carmel, 23 June, 1902, one specimen of the variety with black propodeum (E. J. S. M.). Parasites emerging in March and April, 1912, from a larva, probably of the genus *Heterocampa,* collected at Yalesville, 12 October, 1911 (W. E. B.).

Phanerotoma Wesmael.

°P. **tibialis** Haldeman.

Length 4 mm.; dark fuscous; head, mesonotum, first and second dorsal abdominal segments in their middle, ovipositor beneath, and legs, flavous; antennæ yellowish, their base and apex pale fuscous; ovipositor exserted.

Parasitic on *Grapholitha caryana.*

Urosigalphus Ashmead.

Key to Species.

Apex of abdomen with two processes farther apart than they are long; fore and mid legs mostly brown or brownish;

hind coxæ, trochanters, and femora black or blackish, their tibiæ pale brown beneath, dark brown above, their tarsi dark brown or dusky; exserted portion of ovipositor nearly as long as abdomen; rest of body mostly black or entirely black. Length 2.5 mm. (female) .... **mohawkorum**

Apex of abdomen without processes; head and thorax mostly black; coxæ and trochanters brown; fore and mid legs mostly brownish stramineous, hind legs with rather reddish femora and rather dusky tibiæ and tarsi; abdomen a kind of maroon color throughout; exserted portion of ovipositor nearly two-thirds length of abdomen. Length 3.5 mm. (female) .... **wampanoagorum**

***U. mohawkorum** Viereck (new species).

Related to *U. femoratus* Crawford.

Type locality: New Haven, 6 July, 1904 (H. L. V.).

***U. wampanoagorum** Viereck (new species).

Related to *U. robustus* Ashmead.

Type locality: New Haven, 19 July, 1904 (P. L. B.).

Triaspis Haliday.

Sigalphus Authors, not Latreille.

°**T. curculionis** (Fitch).

Length 3.7-4 mm.; black; labrum and mandibles brown, palpi pale yellowish; antennæ with scape and pedicel reddish, remainder of antennæ black or dark brown; joints three to ten of antennæ sometimes with a reddish tinge; legs pale reddish, with the upper part of hind tibiæ and tarsi and sometimes the hind femora dusky; wings subhyaline, veins pale reddish, stigma black; ovipositor longer than the abdomen.

Larva white with translucent yellowish mottlings. Pupa whitish, length 4.2 mm.; cocoons composed of one layer of closely woven yellow silk.

Parasitic on the plum curculio (*Conotrachelus nenuphar*) and on the potato-stalk weevil. (For an illustration see Chittenden, "Insects Injurious to Vegetables," p. 223, Fig. 143.)

°**T. curculionis**, var. **rufa** Riley.

Head, thorax, and most of first abdominal segment entirely reddish; mid and hind tibiæ dusky; ovipositor three times as long as the abdomen.

Epirhyssalus Ashmead.

***E. atriceps** (Ashmead). *Rhyssalus.*

Length 2.5 mm.; head black; antennæ mostly dark brown, first, second and third joints more or less brownish stramineous or pale brown; palpi stramineous with a brownish cast, mandibles castaneous; thorax and propodeum reddish, with a strong blackish cast on dorsum of propodeum; legs stramineous, except the tarsi which are more or less dusky; wings transparent, with a stramineous stigma, veins darker; abdomen reddish to apex of third dorsal segment, black beyond and mostly blackish ventrally; exserted portion of ovipositor nearly half the length of the abdomen or a little longer; sometimes paler and smaller.

Parasitic on *Archips rosaceana.*

Type locality: New Haven, 4, 7, 14 May, 1904 (H. L. V.), on flowers of gooseberry (*Ribes oxyacanthoides*). One male 1.7 mm. long from Branford, 28 July, 1905 (H. L. V.).

Aleiodes Wesmael.

Rogas Authors, not Nees.

Type: *A. heterogaster* Wesmael.

Wings hyaline, more or less tinged with brown.

Key to Species.

1. Body mostly black; fore and mid legs reddish.............. 2
Body mostly reddish or stramineous 5
2. Hind coxæ, hind trochanters and femora, except tips of latter, reddish 3
Hind legs reddish throughout 4
3. First and second dorsal abdominal segments reddish; antennæ fuscous; hind tibiæ with greater part of basal half yellowish or whitish. Length 6-8 mm. ....terminalis
Antennæ black; hind tibiæ with greater part of basal two-thirds reddish brown; mid and hind tarsi dusky; greater part of first, second, and third dorsal abdominal segments reddish. Length 7.5 mm. (male) ....waldeni
4. Abdomen reddish, its apex more or less blackish. Length 8 mm. ....abdominalis
Abdomen with its first, second, and third dorsal segments reddish, its apex black; dorsum of abdomen covered with dense silvery pubescence. Length 7-8 mm. ....lectus
5. Color of body not as in *parasiticus*......................... 6
Head, propodeum, apex of abdomen, and tips of hind femora and tibiæ black. Length 6 mm. ....parasiticus

6. Color of body yellowish 7
Color of body dull or bright reddish 8

7. Color of body varied with blackish red; propodeum, part of pleuræ, first dorsal abdominal segment except at tip, and sides of second and third dorsal abdominal segments, black. Length 4-5 mm. .... **intermedius**
Color of body dull honey-yellow, more or less varied with fuscous; third and fourth dorsal abdominal segments aciculated; eyes almost circular, not at all emarginate. Length 6 mm. .... **aciculatus**

8. Dull reddish, thorax sometimes varied with fuscous; antennæ of female pale stramineous, of male black, with a broad yellowish annulus; only base of third dorsal abdominal segment aciculated; eyes ovate, scarcely emarginate within. Length 7-9 mm. .... **burrus**
Bright reddish, antennæ dusky; third dorsal abdominal segment not aciculated; eyes elongate, distinctly emarginate within. Length 7 mm. .... **rileyi**

***A. parasiticus** Norton.

Parasitic on *Diprion abietis.*

***A. burrus** Cresson.

Parasitic on *Apatela hasta* and *A. lobeliæ.*

***A. waldeni** Viereck (new species).

Type locality: Stonington, 16 May, 1906 (B. H. W.).

°**A. rileyi** Cresson.

Parasitic on *Apatela oblinita* and *Nephelodes violans.*

°**A. aciculatus** Cresson.

°**A. intermedius** Cresson.

Parasitic on the American tent-caterpillar, (*Clisiocampa*) *Malacosoma americana, Apatela oblinita, A. americana, A. hastilifera* and *A. dactylina.*

°**A. lectus** Cresson.

A. terminalis Cresson.

Parasitic on (*Leucania, Heliophila*) *Cirphis unipuncta* and *Nephelodes violans.*

New Haven, 23 July, 1912.

°**A. abdominalis** Cresson.

Hormius Nees.

H. completus Provancher.

Female: thorax brown, or reddish, only partly black, i. e., propodeum and sternum mostly black; rest of thorax stained with black, or thorax mostly reddish; head and most of abdomen very dark brown; the latter black at base, blackish beneath; mandibles castaneous; palpi stramineous; antennæ mostly brown, dusky apically; legs stramineous; wings transparent, tinted with yellowish brown, stigma stramineous, veins darker; exserted portion of ovipositor about one-fourth the length of the abdomen; length 3 mm. Male: mouth brown; head mostly black; otherwise as in the female.

Rockville, 23 August, 1905 (H. L. V.); New Haven, 31 October, 1903; Putnam, 12 July, 1905 (H. L. V.).

Hecabolus Curtis.

Key to Species.

1. Predominating color stramineous (female and male)........ 2
   Predominating color black or blackish. Female: length 1.5 mm.; face, pleuræ, cheeks, and legs dull stramineous; antennæ pale; wings hyaline; veins and stigma pale fuscous; base and extreme apex of abdomen brownish; ovipositor with its exserted portion about as long as abdomen, sheaths of ovipositor pale, tipped with black ......minimus
2. Length 1.5-3 mm. Female: cheeks paler than remainder of head, tips of mandibles black, antennæ fuscous, pale at base; wings hyaline, iridescent, veins and stigma fuscous, the latter conspicuous; legs, including coxæ, stramineous, ovipositor and sheaths stramineous, each tipped with black. Male: head, mesothorax, scutel, and apical margins of second and following abdominal segments blackish or fuscous, mouth-parts dull stramineous; otherwise as in female ....lycti
   Length 2.25 mm. Female: vertex, eyes, mesothorax, and scutel blackish; antennæ slightly paler at base and beneath; wings hyaline, veins and stigma pale fuscous; legs, including coxæ, stramineous; tarsal claws black; third dorsal abdominal segment and following segments with a blackish tinge; exserted portion of ovipositor rather longer than abdomen, blackish, basal half pale. Male: face and sides of pleuræ dusky; cheeks, pleuræ beneath, and propodeum dull stramineous; abdomen blackish at apex; otherwise as in female ....utilis

°**H. minimus** Cresson.

Parasitic on the larva of *Trogoxylon parallelopipedum.*

°**H. lycti** Cresson.

Said to be a parasite on the larva of the powder-post beetle (*Lyctus striatus*).

°**H. utilis** Cresson.

Heterospilus Haliday.

***H. eurostæ** Viereck (new species).

Female: length 2.5 mm.; thorax mostly black, head and abdomen mostly brownish, the latter brownish stramineous down the middle; first, second, basal half of third, and extreme base of fourth dorsal abdominal segments striated, a suggestion of a transverse furrow between the sculpture and smooth portion of the third dorsal segment; antennæ 26-jointed; ovipositor somewhat shorter than the abdomen; related to *H. aciculatus*.

Type locality: Stonington, 26 April, 1906, reared from galls of *Eurosta solidaginis* (B. H. W.).

Polystenidea Viereck.

***P. metacomet** Viereck (new species).

Female: length 1.5 mm.; black; first and second joints of antennæ and mandibles brown, palpi blackish white; legs stramineous, hind tarsi rather dusky at tip, as is the tip of the hind femora; other tarsi colored about like the hind tarsi; wings transparent, stigma stramineous, veins darker; abdomen brownish beneath; ovipositor scarcely extending beyond the tip of the abdomen.

Type locality: New Haven, 4 July, 1905 (H. L. V.).

MYERSIIDÆ.

Thaumatotypidea Viereck.

Petiole much longer than the propodeum, the latter with a more or less complete apical transverse carina.

***T. spinulata** (Strickland). *Thaumatotypus spinulatus* Strickland.

Female: length 4 mm.; blackish, with fuscous legs; with more or less erect, scattered hairs; propodeum rather concave, with the apical transverse carina developed into a prominent projection on each side of the concavity; first abdominal segment nearly twice as long as the propodeum.

Type locality: New Haven, 20 May, 1911 (A. B. C.).

EVANIIDÆ.*

Key to Genera.

1. Fore wings with but one recurrent vein in each wing........ 2
   Fore wings with two recurrent veins in each wing.......... 5
2. Fore wings, when at rest, folded longitudinally as in hornets (*Vespa*); hind wings without a posterior lobe; abdomen clavate and compressed; basal segment neither filiform petiolate nor strongly contrasted in form to second segment ....(GASTERUPTIONINÆ) **Gasteruption** p. 239
   Fore wings not folded; hind wings with an almost separated posterior lobe; abdomen with its basal segment filiform petiolate, strongly contrasted in form to the remaining segments, which latter together are compressed from side to side, oval, triangular or nearly round .... (EVANIINÆ) 3
3. Fore wings each with a closed median cell 4
   Fore wings each without a closed median cell .....**Hyptia** p. 240
4. Antennæ inserted in a deep basin bordered below by a ridge. **Evania** p. 240
   Antennæ not inserted in a deep basin and without a ridge beneath them ....**Evaniella** p. 241
5. Hind wings veinless excepting costa; claws simple.......... **Pammegischia** p. 242
   Hind wings with one or two closed cells; claws with two or more teeth 6
6. Claws with three or more teeth beneath......**Pristaulacus** p. 241
   Claws with only two teeth beneath ....**Odontaulacus** p. 241

Gasteruption Latreille.

Fœnus Fabricius.

Species of this and an allied genus have been bred from *Crabro, Philanthus, Cerceris, Gorytes, Eumenes, Odynerus, Hylæus, Halictus, Andrena,* and still other wasps and bees.

Length 11-12 mm.; mostly black; wings hyaline and with dark veins; hind tibiæ flattened, clavate.

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* The keys to the subdivisions of this group are mostly from the published work of Dr. J. Chester Bradley, our foremost American authority on this family.

Key to Species.

1. Exserted portion of ovipositor shorter than thorax.......... 2
   Exserted portion of ovipositor equalling or exceeding abdomen in length ....**tarsatorius**
2. Medial mesothoracic lobe shagreened, not striate .... **montanus var. incertus**
   Medial mesothoracic lobe transversely rugose-striate...**micrurus**

G. tarsatorius Say.

Occurs all over the state, and has been taken in August on flowers of goldenrod (H. L. V.).

G. montanus var. incertus Cresson.

This form has the same distribution in Connecticut as the preceding. It has been taken on parsnip flowers in July and August.

G. micrurus Kieffer.

New Haven, 30 July, 1911 (A. B. C.).

Hyptia Illiger.

H. harpyoidea Bradley.

Male antennæ filiform, female antennæ thickened, not filiform; metathoracic sides with close, parallel barring; length 5 mm.; mostly black.

New Haven, 20 July, 1904 (B. H. W.).

Evania Fabricius.

Mostly black.

Key to Species.

1. Face nearly smooth, only inconspicuously and minutely punctate 2
   Face coarsely puncto-striate ....**urbana**
2. Dorsulum, on each side, with a Y-shaped impression ..**lævigata**
   Dorsulum, on each side, with an I-shaped impression ...... **appendigaster**

°**E. urbana** Bradley.

°**E. lævigata** (Oliver?).

This, i.e., Olivier's species, is said to be an American species, parasitic on the Oriental cockroach (*Periplaneta orientalis*). Dr. J. C. Bradley believes that all species of *Evania* have been introduced into this country. Olivier's *lævigata* has generally been placed as a synonym of *appendigaster*.

E. appendigaster Linnæus. Howard, Insect Book, Pl. i, Fig. 1.

Has often been bred from the egg-capsules of the cockroaches.

Evaniella Bradley.

°**E. semæoda** Bradley.

Entirely or almost entirely black; somewhat more than 5 mm. long; face sparingly punctate; thorax densely and coarsely punctate.

Pristaulacus Kieffer.

Key to Species.

1. Claws with four teeth beneath 2
Claws with only three teeth beneath; anterior border of prothorax rounded, toothless 4
2. Anterior border of prothorax rounded, toothless; thorax not hunched; wings mostly violaceous and with a yellow hyaline band beneath stigma ....**fasciatus**
Anterior margin of prothorax toothed, or with a distinct spine 3
3. Medial mesothoracic lobe strongly gibbous ....**niger**
Medial mesothoracic lobe not strongly gibbous.......**flavicrurus**
4. Body longer or shorter than in *subfirmus*, and legs differently colored 5
Length 13.5 mm.; legs black ....**subfirmus**
5. Femora fuscous 6
Femora red; length 16 mm.; rest of legs fulvous....**resutorivorus**
6. Length 14.5 mm.; legs rufous ....**abbotti**
Length 10 mm.; legs yellow ....**stigmaterus**

°**P. (Neaulacus) fasciatus** (Say).

°**P. (Pristaulacus) niger** (Shuckard).

°**P. (P.) flavicrurus** (Bradley).

°**P. (Oleisoprister) subfirmus** (Viereck).

•**P. (O.) resutorivorus** (Westwood).

°**P. (O.) abbotti** (Westwood).

°**P. (O.) stigmaterus** (Cresson).

Odontaulacus Kieffer.

Key to Species.

Abdomen with second segment and apex of first dull claret-red, rest black; hind femora and tibiæ dark brown ..**bilobatus**
Abdomen red; fore and mid legs reddish, femora dark brown **abdominalis**

°**O. bilobatus** (Provancher).

°**O. abdominalis** (Cresson).

Pammegischia Provancher.

Key to Species.

1. Vertex not at all transversely wrinkled; medial mesothoracic lobe not emarginate anteriorly 2
   Vertex transversely wrinkled or reticulate 3
2. Frontal crest distinct; vertex punctate, more especially below; second joint of antennæ as long as third; thorax stained with brown; legs brown and pallid; abdomen and head tawny. Length 4 mm. .... **lovei**
   Frontal crest indistinct; vertex polished and almost impunctate; second joint of antennæ two-thirds as long as third; reddish tawny all over except apex of propodeum, which is brownish. Length 16.5 mm. .... **ouelleti**
3. Vertex transversely wrinkled, especially below, the wrinkles somewhat broken; occiput not distinctly wrinkled...... 4
   Vertex coarsely and deeply reticulate all over; occiput smooth and polished; black; basal half of abdomen, except extreme base of petiole, red; legs brown, tibiæ and knees pale **ashmeadi**
4. Body black and red; legs more or less yellow............. 5
   Body tawny all over except sutures of thorax above, or entire thorax and vertex black. Length 10 mm. ......**burquei**
5. Legs, beyond coxæ, and face, tawny. Length 5 mm. ....**pallipes**
   Legs beyond coxæ brown; fore tibiæ and tarsi and hind tarsi tawny. Length 7.5 mm. ....**xiphydriæ**

°**P. lovei** Ashmead.

°**P. ouelleti** Bradley.

°**P. ashmeadi** Bradley.

°**P. burquei** Provancher.

Bred by Dr. A. D. Hopkins from dead branches of hard maple infested by *Xiphydria abdominalis* (*albicornis*).

°**P. pallipes** Cresson.

°**P. xiphydriæ** Ashmead.

Dr. J. C. Bradley thinks this must be the female of *pallipes*. The species was bred from *Xiphydria provancheri* living in birch twigs.

TRIGONALIDÆ.

The habits of none of the North American species belonging to the family Trigonalidæ are known, but the habits of some of the South American species as well as of some of the European species have been partially worked out, and indicate that the species belonging to this family are either parasites on the larvæ of Vespids, or hyperparasites of the Vespids, attacking the Dipterous parasites of the latter.

Key to Genera.

Second cubital cell petiolate, triangular in outline .... **Lycogaster** p. 243
Second cubital cell not petiolate or triangular in outline .... **Trigonalys** p. 243

Lycogaster Schuckard.

L. pullatus var. **hollensis** Melander and Brues.

Almost entirely black, with the subtegular tubercule yellow. Length 11 mm.

New Haven, July 20, 1904 (W. E. B.).

Trigonalys Westwood.

°**T. sulcata** Davis.

Black, marked with yellow; scutellum yellow. Length 7 mm.

T. (Tapinogonalos) pulchellus Cresson.

Black, with whitish marks, excepting the abdomen and legs which are largely yellowish, and the antennæ which are black except for a whitish annulus.

ICHNEUMONIDÆ.

Key to Genera.

1. Wings present 2
Wings wanting .... **Gelis** p. 327
2. Fore wings with first abscissa of cubitus present, first submarginal cell not confluent with first discoidal cell........ 3
Fore wings with first abscissa of cubitus wanting, first submarginal cell confluent with first discoidal cell........... 4
3. Fore wings without transverse cubiti and with only one submarginal cell, the latter open .... **Praon** p. 259
Fore wings with two transverse cubiti and three submarginal cells, the first and second closed ...... **Ephedrus** p. 258
4. Fore wings with two recurrent veins..................... 5
Fore wings without recurrent veins or with only one recurrent vein .... **Aphidius** p. 259
5. First abdominal segment usually straight in profile, its spiracles placed at or before the middle; if, as is rarely the

case, they are behind the middle, then abdomen compressed or club-shaped 6

First abdominal segment bent or curved toward its apex in profile, abdomen pedunculate and wider than thick, or depressed 8

6. Ovipositor, when exserted, not nearly half the length of abdomen, rarely longer than this, sometimes not at all exserted 7

Ovipositor, when exserted, at least nearly half the length of abdomen, which is sessile or subsessile and depressed; when abdomen is subsessile or pedunculate, as is rarely the case, then head is spherical or cubical; areolet triangular or wanting, rarely pentangular 99

7. Abdomen compressed throughout or with posterior half compressed, petiolate, rarely sessile or subsessile; areolet in form of a triangle, trapezium, rhomboid or trapezoid, or else wanting; face in most genera covered with short, dense, appressed, sericeous pubescence 9

Abdomen usually broader than thick, or depressed throughout, largest toward apex, which is often subcompressed in female; elongate, fusiform, sessile or petiolate, in the latter case never with areolet pentangular; areolet irregular, triangular, or wanting, rarely pentangular 49

8. Exserted portion of ovipositor elongate, rarely but slightly exserted; spiracles of first abdominal segment as a rule nearer to each other than to apex of segment, which is in some genera scarcely broader than more basal portion of segment; areolet pentangular, quadrangular or incomplete; wings sometimes imperfect; sternauli usually well developed; gastrocœli subobsolete or faint, or else entirely absent 120

Ovipositor not, or only slightly exserted; basal half or two-thirds of first abdominal segment slender, its apex generally much expanded, its spiracles nearer to the apex than to each other; base of second abdominal segment almost always with lateral foveæ or gastrocœli; areolet pentangular; sternauli and notauli usually wanting, never well developed 128

9. Cubitodiscoidal cell receiving only one recurrent vein 10

Cubitodiscoidal cell receiving two or both recurrent veins; mid tibiæ with two apical spurs; propodeum smooth or punctate 48

10. Abdomen sessile or subsessile, or, if subpetiolate, petiole not compressed but depressed; areolet rhomboidal; tarsi slender 11

Abdomen usually petiolate, sessile or subsessile only in a few genera 12

11. Tarsal claws pectinate in one or both sexes; abdomen subsessile; spiracles of propodeum linear; third discoidal cell not or but slightly narrowed at base, cubitodiscoidal vein straight and not broken by a ramellus; abdomen wider than thick or depressed in male, acuminate and acutely pointed at tip in female, with an oblique impressed line on each side of segments two to four above; scutel unarmed; body smooth and polished; hind femora short and robust, tarsal claws in male pectinate, in female toothed near tip; second joint of hind trochanters swollen at tip beneath; eyes not emarginated .... **Ceratogastra** p. 273

Tarsal claws not pectinate; abdomen subpetiolate; spiracles of propodeum oval; eyes entire; third discoidal cell narrowed at base, cubitodiscoidal vein much curved upward, and generally with a ramellus arising from it before its middle .... **Exetastes** p. 274

12. Hind femora without a tooth beneath 13

Hind femora with a tooth beneath; areolet wanting; hind trochanters shorter than their coxæ ...... **Pristomerus** p. 274

13. Marginal cell subtriangular or almost trapezoidal 14

Marginal cell lanceolate; median and submedian cells of fore wings not confluent 16

14. Spiracles of first dorsal abdominal segment situated beyond or back of the middle 15

Spiracles of first dorsal abdominal segment situated before the middle .... **Orthopelma** p. 275

15. Antennæ remote from each other at the point of insertion; sternum wider than long; propodeum shorter than thick or high, third discoidal cell rectangular, scarcely narrowed at base; cubitodiscoidal vein straight .... **Porizon** p. 275

Antennæ not remote from each other at the point of insertion; sternum longer than broad, propodeum scarcely or only a little longer than thick or high; third discoidal cell more or less narrowed at base; cubitodiscoidal vein arched above .... **Porizonidea** p. 275

16. Spiracles of propodeum round 17

Spiracles of propodeum usually oval or elongate 42

17. Areolet small, subtriangular, subpentangular or wanting.... 18

Areolet large, rhomboidal; ovipositor and male cerci exserted .... **Mesochorus** p. 277

18. Clypeus with a suture or depression between it and face . 19

Clypeus with an imperfect suture between it and face, or completely fused with the latter 20

19. Abdomen sessile or subsessile, more or less broader than thick or depressed; areolet oblique or wanting ....
Plectiscidea p. 275

Abdomen petiolate, compressed throughout, ovipositor straight; areolet wanting ....**Cremastus** p. 277

20. Propodeum not overlapping hind coxæ to end of basal third of latter; mesosternum without a process on each side of mesosulcus or median longitudinal furrow of mesosternum; propodeal spiracles round or nearly round, or if elliptical then without a foveolate furrow on each side of the petiole 21

Propodeum overlapping hind coxæ at least to the end of basal third of the latter ....**Casinaria** p. 268

21. Eyes not distinctly hairy; not distinctly converging below in female 22

Eyes distinctly hairy, distinctly converging below in female **Cymodusa** p. 262

22. Clypeus truncate or rounded along anterior edge, the latter edge not produced medially; recurrent vein usually received beyond middle of areolet 23

Clypeus with its anterior edge medially produced into a more or less distinct tooth, or with the same edge impressed on each side of middle; recurrent vein received before middle of areolet; first abscissa of discoidal vein usually distinctly longer than second; nervellus angulated below middle ....**Sagaritis** p. 262

23. Areolet normally wanting 24

Areolet normally present ,.............................. 26

24. Nervellus angulated below middle 25

Nervellus not angulated, vertical; head not at all cubical, occipital carina at least as far below level of lower edge of hind ocelli as hind ocelli are from each other; lower angle of marginal cell not almost a right angle; costulæ incomplete or wanting; claws pectinate .... **Campoplex (Dioctes)** p. 266

25. Longitudinal axis of thorax not appreciably longer than vertical axis; petiole without a fossa on each side .... **Campoplex** p. 263

Longitudinal axis of thorax appreciably longer than vertical axis; petiole with a fossa on each side .... **Casinaria (Pseuderipternus)** p. 269

26. Nervellus angulated below middle, more or less branched; propodeal carinæ well developed; areolet petiolate; clypeal foramina rather inconspicuous 27

Nervellus not angulate below middle, not at all branched ... 32

27. Costulæ complete, well developed 28

Costulæ incomplete or poorly developed 29

28. Petiole without a fossa on each side, not depressed, rather cylindrical, postpetiole bulbous .... **Campoplex** p. 263

Petiole with a fossa on each side; recurrent vein received beyond middle of areolet; subdiscoidal vein wanting in hind wings; ovipositor hidden or at least not prominent. **Campoplex (Ameloctonus)** p. 266

29. Petiole without a fossa on each side near postpetiole 30

Petiloe with a fossa on each side near postpetiole .... **Campoplex (Nepiera)** p. 266

30. Greatest diameter of lateral ocelli as long as or very nearly as long as ocellocular line 31

Greatest diameter of lateral ocelli distinctly shorter than ocellocular line ....**Campoplex (Bathyplectes)** p. 263

31. Ovipositor hardly exserted ..**Campoplex (Hypothereutes)** p. 264

Ovipositor distinctly exserted ....**Campoplex** p. 263

32. Second abscissa of discoidal vein distinctly shorter than third 33

Second abscissa of discoidal vein as long as or longer than third 35

33. Costulæ wanting, incomplete, or poorly developed.......... 34

Costulæ complete, well developed; petiole with a fossa on each side near postpetiole ....**Campoplex (Hyposoter)** p. 267

34. Abdomen conical at apex in female; petiole with a fossa on each side near postpetiole ......**Campoplex (Angitia)** p. 264

Abdomen truncate at apex in female; petiole with, at most, a punctiform fossa on each side near postpetiole .... **Campoplex (Holocremnus)** p. 264

35. Costulæ distinct and complete; recurrent vein received in or beyond middle of areolet 36

Costulæ indistinct or incomplete........................... 39

36. Spiracles of first segment distinctly nearer to each other than to apex 37

Spiracles of first segment apparently as near or nearer to apex than to each other; petiole with a fossa on each side near postpetiole; areola and petiolarea confluent; hind claws not distinctly pectinate; lower angle of radial cell almost a right angle; ovipositor not prominently exserted **Campoplex (Ameloctonus)** p. 266

37. Petiole with a more or less distinct fossa on each side near postpetiole; lower angle of radial cell distinct, almost forming a right angle; hind claws distinctly pectinate 38

Petiole rather cylindrical, not wider than thick dorso-ventrally, without a fossa on each side near postpetiole .... **Campoplex** p. 263

38. Abdomen truncate at apex, ovipositor hardly longer than apical truncature of the abdomen .... **Campoplex (Ameloctonus)** p. 266

Abdomen conical at apex, ovipositor prominently exserted **Campoplex (Angitia)** p. 264

39. Ocelloccipital line hardly longer than postocellar line; lower angle of radial cell almost a right angle; hind claws distinctly pectinate 40

Ocelloccipital line apparently one and one-half times as long as postocellar line; ovipositor hidden or at least not longer than apical truncature of abdomen; head lenticular, hardly produced beyond upper end of eye as seen in profile, almost vertical between hind ocelli and occipital carina; clypeal foramina and petiolar fossæ distinct ..... **Campoplex (Ameloctonus)** p. 266

40. Petiole with a fossa on each side near postpetiole............ 41

Petiole without a fossa on each side near postpetiole; female abdomen truncate at apex....**Campoplex (Hypothereutes)** p. 264

41. Abdomen truncate at apex in female .... **Campoplex (Ameloctonus)** p. 266

Abdomen conical at apex in female **Campoplex (Angitia)** p. 264

42. Tarsal claws pectinate or not pectinate; scutel convex, its apex rounded, areolet usually present 43

Tarsal claws not pectinate 45

43. Spiracles of first abdominal segment placed in or before middle; spiracles of propodeum oblong..................... 44

Spiracles of first abdominal segment placed behind middle; head not inflated behind eyes; clypeus not separated from face by a suture; teeth of mandibles subequal..**Casinaria** p. 268

44. Head not inflated behind eyes, the latter touching base of mandibles, which in turn are slender and provided with two unequal teeth at apex; propodeum without carinæ or tubercles; spiracles of first abdominal segment placed before middle ....**Paniscus** p. 280

Head inflated behind eyes, the latter not touching base of mandibles, which in turn are not slender and have two equal teeth at apex; propodeum carinate and tuberculate; spiracles of first abdominal segment in its middle .... **Opheltes** p. 281

45. Cubitodiscoidal cell receiving second abscissa of discoidal vein in middle, third discoidal cell narrowed at base...... 46

Cubitodiscoidal cell receiving second abscissa of discoidal vein before its middle; eyes not hairy................... 47

46. Hind tarsi with first joint about four times as long as second, apical margin of clypeus broadly rounded..**Heteropelma** p. 285

Hind tarsi with first joint about twice as long as second; apical margin of clypeus truncate ....**Therion** p. 286

47. Third discoidal cell narrowed at base; apical margin of clypeus acutely angled or pointed ....**Erigorgus** p. 281

Third discoidal cell not narrowed at base; apical margin of clypeus truncate ....**Paracanidia** p. 273

48. Wings fuscous, stigma obsolete; clypeus at apex obtusely pointed; ocelli not prominent; thorax and legs not glabrous but covered by short, rather dense pubescence; propodeum truncated behind and rather coarsely rugose ...... **Thyreodon** p. 287

Wings hyaline, stigma distinct, well developed; clypeus at apex truncate; ocelli prominent; thorax and legs glabrous; propodeum rounded behind, not rugose ....**Ophion** p. 287

49. Abdomen rarely coarsely and deeply punctate, if so, hind tibiæ not provided with two spurs 50

Abdomen deeply and coarsely punctate or aciculate; scutel large, usually margined; hind tibiæ provided with two spurs; robust genera 98

50. Face not strongly protuberant, or if so, clypeus distinct..... 51

Face strongly protuberant and coarsely punctate; clypeus not defined or else small................................ 91

51. Mandibles bidentate or toothless 52

Mandibles tridentate 88

52. Hind tibiæ with two spurs; abdomen petiolate, or, if sessile, exserted portion of ovipositor shorter than abdomen or not at all exserted; hind legs not both long and thick; antennæ not short and straight; mandibles not projecting forward and not forming a visible cavity with clypeus; head and clypeus normal, the latter usually narrowed and nearly elliptical; areolet not large and rhomboidal, quadrangular, triangular or wanting, rarely an irregular pentagon; male without styloid projections; scutel not provided with a discal spine, stigma present; ovipositor not or scarcely exserted, if prominently exserted, then lunulæ present, otherwise lunulæ wanting or at least not present on both second and third dorsal segments in same individual; propodeum not sloping directly from base........ 53

Hind tibiæ without spurs, or at most with a single small one; teeth of mandibles equal in length 69

53. Tarsal claws not pectinate, or with only a few strong teeth at base, in which case clypeus usually extends from eye to eye 54

Tarsal claws pectinate 77

54. Abdomen petiolate, petiole at its base without a groove or carina, or the latter at least never prominent............. 55

Abdomen sessile or subsessile, with a plain furrow or sharp carina on petiole, seldom subpetiolate, but, if so, then always with prominent carinæ; eyes not emarginate within.. 66

55. Head not exceptionally enlarged........................... 56

Head exceptionally enlarged; longer spur of hind tibiæ shorter than second joint of hind tarsi; wings with an areolet ....**Spanotecnus** p. 292

56. Flagel 35- to 40-jointed, frequently thickened; petiole usually arched; in female last abdominal segments so recurved that ovipositor seems to lie on the back................ 64

Flagel not thickened; last abdominal segments of female not recurved as described in preceding paragraph........ 57

57. Hind femora not thickened; ovipositor rarely curved upwards 58

Hind femora thickened; ovipositor curved upwards .... **Catoglyptus** p. 291

58. Cheeks either punctate or shagreened, or both............ 59

Cheeks perfectly smooth, neither punctate nor shagreened; wings with an areolet ....**Gausocentrus** p. 290

59. Clypeus plainly divided by an elevation, face not narrowed beneath; second to fourth dorsal abdominal segments not twice as broad as long, first dorsal abdominal segment with a carina on each side, which extends from spiracle to apex; wings without an areolet, radius starting from middle of stigma; apical joint of hind tarsi not often curved, not as long as third, plainly longer than fourth; propodeum not or incompletely areolated..**Mesoleptidea** p. 290

Clypeus, face, second to fourth dorsal abdominal segments and first dorsal abdominal segment as in description of *Mesoleptidea* given above; wings with an areolet.......... 60

70. Last joint of hind tarsi either plainly shorter than third or, when as long, then not bent or curved.................... 61

Last joint of hind tarsi as long as or longer than third, and plainly bent or curved; body and antennæ long and slender. **Hadrodactylus** p. 289

61. Clypeus without an apical impression..................... 62

Clypeus impressed before apex, finely margined; mesonotum and scutel shagreened and punctate ....**Rogas** p. 289

62. Clypeus not flat; second lateral area without a tooth-like projection 63

Clypeus flat; second lateral area projecting tooth-like; radius starting back of middle of stigma ....**Oxytorus** p. 289

63. Radius starting from middle of stigma; nervellus branched above middle; mesonotum shagreened and punctate ...... **Symphobus** p. 289

Radius starting before middle of stigma; nervellus branched below middle; mesonotum and scutel smooth, punctate; antennæ without a pale annulus ....**Zemiodes** p. 288

64. Propodeum areolated at base 65

Propodeum not areolated at base..............**Polycinetis** p. 291

65. Wings without an areolet ....**Homaspis** p. 291

Wings with an areolet; second dorsal abdominal segment with two median carinæ at base ....**Notopygus** p. 291

66. Sides of first dorsal abdominal segment not or scarcely broadened as in *Otoblastus* 68

Sides of first dorsal abdominal segment broadened, ear-shaped at base ....**Otoblastus** p. 296

67. Fore wings with an areolet, cubitodiscoidal vein rarely branched; metapleuræ not projecting tooth-like over hind coxæ 67

Fore wings without an areolet or with areolet incomplete; mid femora without teeth, hind trochanters without a tooth beneath 75

68. Areolet very irregular, oblique, not rhombic 69

Areolet regular and almost rhombic; second and third dorsal abdominal segments without oblique impressions .... **Rhimphalea** p. 296

69. Second dorsal abdominal segment without thyridia and with a carina not extending to spiracle; propodeum more or less areolated; nervellus branched 70

Second dorsal abdominal segment with distinct thyridia at base 72

70. Nervellus branched at or below middle; propodeum not completely areolated; clypeus separated at base by an elevated margin; a sharp ridge extending from spiracles to apex of basal dorsal abdominal segment......................... 71

Nervellus branched above middle; clypeus plainly separated at base by an elevated margin ....**Otlophorus** p. 295

71. Antenna swollen above middle, and with its segments broader than long and verticillate at apex .... **Provancherella** p. 295

Antenna slender, not strongly verticillate; petiole of abdomen longer than broad ....**Synœcetes** p. 295

72. Clypeus distinctly divided by a nearly median elevation, anterior half somewhat flattened and somewhat sloping, usually of a different color from the base 73

Clypeus without a distinct transverse median ridge; nervellus broken at or below middle; mandibles distinctly toothed at apex; areolet distinctly petiolate; third dorsal abdominal segment not distinctly longer than wide; mesopleuræ without a posterior projecting tooth, propodeum more or less areolated, but not entirely so; clypeus neither compressed so that it projects like a tooth in the middle nor forming a flat triangle; first dorsal abdominal segment with two keel-like carinæ which extend beyond spiracles ..... **Dialges** p. 293

73. Front without a distinct tooth............................. 74

Front above antennæ with a strong tooth, face elongate, projecting tooth not or but slightly concave, clypeal grooves not beset with long hairs ....**Cosmoconus** p. 294

74. Propodeum not regularly areolated, but with carinæ, and polished; transverse carinæ wanting, longitudinal carinæ distinct and sharp ....**Quadrigana** p. 294

Propodeum more or less perfectly areolated; edge of antennal grooves not elevated; clypeus without two small teeth at apex; teeth of mandibles distinct ....**Tryphon** p. 293

75. Second dorsal abdominal segment with distinct thyridia at base, propodeum not entirely areolated; clypeus without teeth at apex; apex of abdomen more or less slightly compressed; stigma not longer than marginal cell, areolet entirely wanting; mandibles toothed, lower tooth as long as upper; apical segment of hind tarsi shorter than third; base of discoidal cell as long as or longer than nervullus; malar line shorter than mandibles are wide at base; first to third dorsal abdominal segments not rugose, first not more than twice as broad at apex as at base; clypeus without a transverse row of bristles on anterior edge; sutures between first to third dorsal abdominal segments not deep; clypeus without lateral impressions; dorsulum, scutel, and first to third dorsal abdominal segments shagreened; ridge of vertex not broken in middle; lateral carina from spiracles to apex of basal dorsal abdominal segments present; propodeum with more or less distinct carinæ................ 76

Second dorsal abdominal segment without thyridia at base, or else they lie very close to the base and are quite invisible; nervellus broken at or below middle; propodeum not entirely areolated; ridge of vertex not broken in middle; base of discoidal cell as broad or broader than nervelus, areolet usually entirely wanting; clypeus emarginate, almost semicircular on its anterior edge ....**Sphecophaga** p. 293

76. Basal segment of hind tarsi inflated ....**Holmgrenia** p. 293

Basal segment of hind tarsi not inflated; propodeum above finely and opaquely shagreened; clypeus more or less transversely impressed at sides of anterior margin, which latter is thereby elevated and more or less deeply emarginate centrally ....**Mesoleius** p. 292

77. Abdomen distinctly petiolate or subpetiolate................ 78

Abdomen not distinctly petiolate, more nearly sessile 81

78. Tarsal claws toothed with long and close-set teeth........ 79

Tarsal claws toothed with fewer, shorter or more distant teeth 80

79. Clypeus scarcely elevated above face, not compressed at tip. **Rhorus** p. 300

Clypeus distinctly elevated above face and compressed at tip; wings with an areolet ....**Ctenopelma** p. 300

80. First dorsal abdominal segment much broadened behind spiracles, following segments as broad as long; clypeus without a transverse ridge; propodeum distinctly areolated .. **Sympherta** p. 299

First dorsal abdominal segment only partially broadened behind spiracles, following segments not as broad as long;

nervellus not disappearing toward base; propodeum above not regularly areolated, and with only a very low, apical median area; distance between ocelli greater than ocellocular line ....**Eczetesis** p. 299

81. Male antennæ not broadly thickened in middle; ovipositor distinctly exserted 82

Male antennæ broadly thickened in middle; ovipositor not exserted ....**Euceros** p. 299

82. Basal dorsal abdominal segments without transverse impressions; antennæ rarely thickened in middle.............. 83

Basal dorsal abdominal segments with transverse impressions; antennæ slightly thickened in middle and tapering toward apex ....**Scopiorus** p. 298

83. Femora not thickened, or, if so, clypeus not separated from face by a suture; groove of clypeus not covered with a tuft of hair 84

Femora thickened; grooves at sides of clypeus covered by a tuft of hair; areolet present ....**Erromenus** p. 298

84. Clypeus elevated and separated from face by a distinct transverse furrow, or, if not, propodeum polished and without distinct carinæ; tarsal claws not thickly pectinate at tip, but with comb-like teeth at base 85

Clypeus not distinctly elevated and separated from face; propodeum carinated ....**Monoblastus** p. 297

85. Vertex not separated from occiput by a sharp ridge; propodeum without carinæ; areolet wanting; metatarsi enlarged; antennæ longer than body ....**Scolobates** p. 297

Vertex separated from occiput by a sharp ridge .... **Polyblastus** p. 297

86. Tarsal claws not pectinate 87

Tarsal claws pectinate; margin of first dorsal abdominal segment not hollowed out; areolet present; hind tibiæ without a spur, subpetiolate; basal dorsal abdominal segment distinctly broadened from base toward apex ..**Exenterus** p. 301.

87. First dorsal abdominal segment broadened ear-like at base, second dorsal abdominal segment at apex twice as broad as first at its apex ....**Exyston** p. 300

First dorsal abdominal segment not broadened ear-like at base ....**Anecphysis** p. 301

88. Basal dorsal abdominal segment without a transverse impression; areolet wanting 89

Basal dorsal abdominal segment with a transverse impression; areolet wanting; propodeum with an apical transverse carina and a basal area, spiracles small and round; nervellus broken below middle ....**Diplazon** p. 302

89. Face finely shagreened, alutaceous or coriaceous; propodeum exareolated; cubitodiscoidal vein angularly broken and usually with a ramellus; nervellus very obtuse, angularly broken below middle .... **Syrphoctonus** p. 302
Face smooth and shining; antennæ more than 20-jointed; clypeus separated from face by a suture; propodeum areolated; nervellus broken at or near middle.... **Promethes** p. 302

90. Scape elongated 91
Scape globular 92

91. Areolet present, outer vein of areolet often translucent; transfacial line not much longer than facial line; notauli wanting; nearly all flagellar joints in female longer than thick; second dorsal abdominal segment without transverse impressions .... **Orthocentrus** p. 305
Areolet wanting; epomia wanting on sternum; propodeum with basal area and areola confluent.... **Brephoctonus** p. 305

92. Abdomen petiolate, in some species broadly so, spiracles of first dorsal abdominal segment situated in or behind middle 93
Abdomen sessile or nearly so, spiracles of first dorsal abdominal segment situated in or before middle, basal segment broad and short; propodeum usually areolated at base.... 94

93. Hind tibiae with a single small spur.............. **Periope** p. 308
Hind tibiæ with two spurs; areolet wanting; second joint of male antennæ excavated .... **Alcocerus** p. 308

94. Second dorsal abdominal segment without a median carina.. 95
Second dorsal abdominal segment with a median carina .... **Chorineus** p. 308

95. First joint of flagel decidedly longer than second.......... 96
First joint of flagel not or scarcely longer than second; propodeum with six areæ .... **Hyperacmus** p. 305

96. Pleural areæ of propodeum usually separated from each other by a sharp transverse carina 97
Pleural areæ of propodeum not separated from each other by a transverse carina; areolet present ...... **Triclistus** p. 307

97. Vertex separated from occiput by a sharp ridge .... **Metacœlus** p. 307
Vertex and occiput without a sharp ridge between them; propodeum with two median carinæ .... **Exochus** p. 306

98. Face with a distinct shield; mid tibiæ with two spurs; basal segments of abdomen pyramidal or oval above; ovipositor rarely visible .... **Metopius** p. 309
Face without a distinct shield; mid tibiæ with a single spur; eyes distinctly emarginate; first, second, and third dorsal abdominal segments with parallel carinæ; scutel margined .... **Pseudometopius** p. 308

99. Head transverse, cheeks usually not much swollen; abdomen sessile or subsessile 100

Head more or less cubical, spherical or subquadrate, more or less extended behind eyes, mandibles generally protruding and forming with the depressed mouth a kind of mouth opening; abdomen sessile or subsessile, rarely petiolate 115

100. Abdomen subcompressed (but never so that its dorsum becomes carinate), and always broader than high or depressed at base; ovipositor issuing from apex of abdomen, last ventral segment long, lanceolate 101

Abdomen distinctly broader than high or depressed, sometimes subcompressed toward apex in female 102

101. Areolet triangular, petiolate, receiving second recurrent vein at or near its tip; legs and antennæ slender; clypeus with a suture between it and the rest of the face..**Coleocentrus** p. 327

Areolet wanting; hind tibiæ and tarsi long and slender, tibiæ almost twice the length of hind femora, which latter are somewhat thickened; antennæ much longer than head and thorax; first submarginal cell receiving both recurrent veins, or second recurrent vein uniting with transverse cubital vein ....**Arotes** p. 326

102. Dorsulum transversely rugose; fore tarsi more than twice as long as fore tibiæ.................................. 103

Dorsulum not transversely rugose; fore tarsi not twice as long as fore tibiæ 104

103. Hind coxæ not cylindrical, but swollen towards base; abdomen finely sculptured, convex above in male, with subquadrate segments that are neither emarginate at apex nor channeled ....**Rhyssa** p. 326

Hind coxæ cylindrical; abdomen smooth and shining, very much longer than wide in male, flat above, and with third to seventh dorsal abdominal segments more or less grooved longitudinally and emarginate at apex .... **Megarhyssa** p. 324

104. Second and succeeding dorsal abdominal segments with their surface uneven on account of presence of tubercles or depressions, or both, or even and without tubercles, but with body yellowish 105

Second and succeeding dorsal abdominal segments even and without tubercles or depressions, but body not yellowish 111

105. Intermediate segments of abdomen, at least in male, longer than broad, rarely quadrate.............................. 106

Intermediate segments of abdomen invariably broader than long; fore femora not emarginate 107

106. Areolet triangular; exserted portion of ovipositor as long as or longer than abdomen; tarsi with their apical joint three

or more times longer than penultimate joint; upper vein of third discoidal cell not at all or but slightly arched, so that this cell receives the median vein at its upper basal angle ..,.................................... **Ichneumon** p. 323

Areolet wanting; exserted portion of ovipositor nearly half the length of abdomen; apical tarsal joint with a prominent empodium, tarsal claws deeply cleft .... **Hymenoepimeces** p. 323

107. Ovipositor issuing from a ventral cleft 108

Ovipositor issuing from apex of abdomen; scutel rounded or convex, not quadrangular 110

108. Areolet triangular, complete 109

Areolet incomplete or wanting; femora slender, not thickened; clypeus separated from rest of face by a suture .... **Polysphincta** p. 317

109. Abdomen smooth and shining, impunctate; body yellow .... **Theronia** p. 323

Abdomen more or less punctate; body black.... **Scambus** p. 318

110. Abdomen more or less punctate; tarsal claws not pectinate, areolet wanting; exserted portion of ovipositor less than half the length of the abdomen .... **Clistopyga** p. 317

Second to fourth dorsal abdominal segments each with an oblique linear depression on each side; tarsal claws pectinate .... **Glypta** p. 316

111. Ovipositor issuing from apex of abdomen; areolet complete and triangular, rarely incomplete 112

Ovipositor issuing from a ventral cleft; tarsal claws not pectinate 114

112. Tarsal claws not pectinate, only bristly at base 113

Tarsal claws pectinate .... **Meniscus** p. 312

113. Head and thorax with long conspicuous hair.... **Arenetra** p. 315

Head and thorax with short inconspicuous hair.. **Lissoneta** p. 313

114. Areolet present and triangular; flagel not emarginate........ **Phytodietus** p. 311

Areolet wanting; third and fourth joints of male flagel emarginate or excavated .... **Lissonota (Cylloceria)** p. 314

115. Hind femora not toothed beneath; front without a horn.... 116

Hind femora with a tooth beneath that is directed backward; mid tibiæ of female appearing as if twisted; head nearly spherical .... **Odontomerus** p. 311

116. Areolet wanting 117

Areolet present 118

117. Face narrowed beneath, cheeks tuberculate behind their flattened and depressed posterior orbital edge; tibiæ slender, not inflated; propodeum not areolated .... **Xorides** p. 310

Face not narrowed beneath and cheeks not tuberculate; fore and mid tibiæ in female cylindrical, narrowed and constricted at base, mid tibiæ not appearing as if twisted; head subquadrate, joints of flagel cylindrical, body not cylindrical; marginal cell extending nearly to apex of wing **Xylonomus** p. 310

118. Eyes subemarginate; hind coxæ cylindrical, as long as or nearly as long as hind femora 119

Eyes not emarginate; hind coxæ swollen, shorter than hind femora, areolet subpetiolate, triangular, tibiæ not inflated; propodeum not areolated, but with a shallow longitudinal groove on its disk .... **Euxorides** p. 309

119. Face roughened, cheeks without a tooth-like process; propodeum areolated; fore and mid tibiæ of female dilated, narrowed, and towards the base appearing as if twisted; abdomen subpetiolate, clavate, basal segment straight, gradually widened toward apex .... **Labena** p. 309

Face smooth, not roughened, polished, cheeks with a tooth-like process; propodeum not areolated, smooth and polished; tibiæ not as in *Labena;* abdomen petiolate, basal segment straight, but curved upward towards apex, which is somewhat dilated, exserted portion of ovipositor as long as first abdominal segment .... **Grotea** p. 309

120. Wings normal 121

Wings rudimentary or absent; exserted portion of ovipositor more than half the length of first abdominal segment; propodeum not or indistinctly areolated 127

121. Ovipositor distinctly exserted 122

Ovipositor not or scarcely exserted; abdomen smooth and polished, ovate or almost circular, wider than thick or depressed .... **Stilpnus** p. 341

122. Areolet complete 123

Areolet incomplete, forming an imperfect pentagon, its outer nervure wanting .... **Hemiteles** p. 337

123. Areolet pentangular or subquadrate 124

Areolet rectangular, receiving second recurrent vein at or near its tip .... **Mesostenidea** p. 329

124. Antennæ of female with joints of flagel rather nodose at tip 125

Antennæ with joints of flagel cylindrical throughout; propodeum with elongate linear spiracles 126

125. Third joint of antennæ at most twice as long as thick, or antennæ thickened between middle and apex and in some species also expanded; postpetiole in male broader than petiole, first dorsal abdominal segment geniculate .... **Phygadeuon** p. 333

Third joint of antennæ in most species three or more times as long as thick (if shorter, then propodeum not areolated), not thickened or expanded towards middle; postpetiole not much broader than petiole, first dorsal abdominal segment slightly geniculate ....**Agrothereutes** p. 330

126. Outer vein of third discoidal cell bent beneath apex; malar space prominent ....**Joppidium** p. 330
Outer vein of third discoidal cell straight; malar space not prominent, nearly crowded out by the eyes..**Acroricnus** p. 330

127. Scutel distinctly defined, with sutures all around it; hind tarsi with their penultimate joints not bilobed; wings rudimentary, extending beyond base of propodeum; first abdominal segment punctate, not longitudinally wrinkled **Aptesis** p. 328
Scutel not distinctly defined; face rather rounded .... **Gelis** p. 327

128. Propodeal spiracles linear or oval.......................... 129
Propodeal spiracles circular, scutel scarcely or not at all elevated, propodeum not produced beyond insertion of hind legs; mandibles bidentate, teeth equal or subequal in length 134

129. Petiole of abdomen not broader than high................. 130
Petiole of abdomen broader than high..................... 133

130. Abdomen of female acute at tip, last ventral segment retracted, fourth ventral abdominal segment in male with a longitudinal fold 131
Abdomen of female obtuse at tip, last ventral segment slightly or not at all retracted, fourth ventral abdominal segment in male without a longitudinal fold...................... 132

131. Scutel more or less flat, or simply convex, and then gradually sloping to apex; propodeum rarely bispinose ...... **Amblyteles** p. 344
Scutel strongly elevated or hunched, abruptly declivous posteriorly; propodeum invariably bispinose..**Hoplismenus** p. 343

132. Scutel flat or simply convex ..**Amblyteles (Pterocormus)** p. 344
Scutel strongly elevated, generally subpyramidal..**Trogus** p. 343

133. Scutel carinate laterally ....**Platylabus** p. 342
Scutel not carinate laterally ....**Eurylabus** p. 342

134. Second dorsal abdominal segment without thyridia at base.. 135
Second dorsal abdominal segment with more or less distinct thyridia at base ....**Phæogenes** p. 341

135. Mandibles of female not emarginate on their inferior margins; postscutel without depressions; flagel of male slender at base ....**Eparces** p. 342
Mandibles of female emarginate on their inferior margins; flagel of male filiform ....**Colpognathus** p. 342

Ephedrus Haliday.

°**E. incompletus** Provancher.

Length 2.5 mm.; black; legs and abdomen more or less stramineous. Parasitic on *Myzus cerasi, Macrosiphum rosæ* and *Nectarophora rudbeckiæ.*

Praon Haliday.

Key to Species.

1. Length 3 mm.; bright yellowish red, smooth and polished **humulaphidis**
Length 2 mm.; at least head and thorax mostly blackish; abdomen mostly blackish 2
2. Clypeus, mandibles and legs brownish stramineous; wings hyaline, faintly smoky, with blackish veins ....**alaskensis**
Blackish, except part of abdomen, thorax beneath, and face, which are brownish, and first, second, and third antennal joints, which are yellowish testaceous; otherwise as in preceding species ....**pequodorum**

°**P. humulaphidis** Ashmead.

Parasitic on the hop plant aphis.

P. alaskensis Ashmead.

West Haven, 27 June, 1905, taken in sweeping through a cultivated field (H. L. V.).

***P. pequodorum** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.). Bred from aphids on black birch, 1 July, 1913 (L. B. Ripley).

Aphidius Nees.

Key to Species.

1. Fore wings without a recurrent vein 2
Fore wings with one recurrent vein represented in a discocubital vein, wings without brown bands; mesopleuræ without a furrow; mesonotum not distinctly punctate; median longitudinal carina of propodeum dividing near middle to form a petiolarea; stigma not attenuated, hardly five times as long on margin of wing as wide between the latter margin and origin of radius; joints of flagel at least twice as long as thick 7
2. Fore wings without either part of the cubitus or transverse cubitus 3
Fore wings with a transverse cubitus and part of cubitus; propodeum without carinæ; thorax polished, black; mid and hind legs usually blackish; female antennæ usually 13-jointed, sometimes 11- or 12-jointed; male antennæ 14- or 15-jointed ....**testaceipes**
3. Hypopygium in female developed into a process with two prongs 4

Hypopygium in female simple, not developed into a process with two prongs.. 6

4. Propodeum areolated 5

Propodeum not areolated; second discoidal cell indistinct; clypeus, mouth, scape, pedicel, legs and abdomen almost entirely stramineous; antennæ 12-jointed; head and thorax mostly blackish. Length 1.75 mm. (female) ......**exareolatus**

5. Second discoidal cell complete; petiole constricted at base and apex; first three antennal joints and legs stramineous; abdomen mostly brownish, first and second sutures and apex yellowish ....**rhagii**

Second discoidal cell incomplete or indistinctly defined; hind and mid tibiæ and femora dark brown, nearly black; first three antennal joints and apex of abdomen stramineous **aceris**

6. Legs and petiole stramineous or reddish; male antennæ 15- or 16-jointed; female antennæ 13-jointed ....**salicaphis**

Legs and petiole black or blackish; male antennæ 16- or 17-jointed; female antennæ 13- to 15-jointed, rarely 13-jointed **rapæ**

7. Legs usually pale, stramineous, at most brownish but never blackish or black 8

Legs and body mostly black or blackish; stigma rather lanceolate, not approximating an equilateral triangle in outline; petiole without a smooth space, uniformly rugulose; face beneath antennæ and fore legs more or less stramineous **nigripes**

8. Not almost entirely stramineous; head, mesonotum, and propodeum always black or blackish 9

Almost entirely stramineous; head black, mesonotum, and abdomen above sometimes infuscated; female antennæ 17- to 19-jointed; male antennæ 19- to 23-jointed ....**polygonaphis**

9. Female antennæ 17- or less than 17-jointed; male antennæ 20- or less than 20-jointed 10

Female antennæ 17- to 20-jointed; male antennæ 20- to 21-jointed; face yellowish or brown ....**rosæ**

10. Female antennæ 14- to 17-jointed; male antennæ 17- to 20-jointed 11

Female antennæ 14- to 15-jointed; male antennæ 16- to 18-jointed; blackish brown. Length 1.5 mm. ....**phorodontis**

11. Petiolarea nearly rectangular; second and third joints of maxillary palpi not more than twice as long as thick; hind coxæ and femora stramineous ....**avenaphis**

Petiolarea distinctly pentagonal; second and third joints of maxillary palpi four times as long as thick ....**ribis**

***A. (Trioxys) exareolatus** Viereck (new species).

Type locality: New Haven, 17 June, 1905. Reared from the rose aphis (B. H. W.).

°**A. (T.) rhagii** Ashmead.

Said to be parasitic on the beetle *Rhagium lineatum*.

A. (T.) aceris Haliday.

Host: *Chaitophorus aceris.*

A. (Lysiphlebus) testaceipes (Cresson).

Parasitic on *Aphis maidis, A. gossypii, A. setariæ, A. brassicæ, A. maidiradicis, A. medicaginis, A. heraclii, Toxoptera graminum, Siphonophora cucurbitæ, Myzus ribis, M. cerasi, Siphocoryne avenæ, Macrosiphum rosæ, M. granaria,* and *Rhopalosiphum dianthi.*

New Haven, 4 July, 1905 (H. L. V.).

A. (Diæretus) rapæ Curtis.

Parasitic on *Aphis brassicæ.* New Haven, 26 June, 1905 (H. L. V.).

°**A. (D.) salicaphis** (Fitch).

Parasitic on *Chaitophorus populicola.*

A. (Aphidius) nigripes Ashmead.

Parasitic on *Macrosiphum granaria.*

West Haven, 27 June, 1905 (H. L. V.).

°**A. (A.) polygonaphis** (Fitch). Knotweed *Aphidius.*

Parasitic on an aphid on *Polygonum, Macrosiphum rudbeckiæ* and *Siphonophora liriodendri.*

A. (A.) rosæ Haliday.

Parasitic on the rose aphis (*Macrosiphum rosæ*).

West Haven, 27 June, 1905; Putnam, 12 July, 1905; Cheshire, 8 July, 1904 (H. L. V.); New Haven, 17 June, 1905 (B. H. W.).

°**A. (A.) phorodontis** Ashmead.

Parasitic on *Phorodon mahaleb* and *Rhopalosiphum dianthi.*

A. (A.) avenaphis (Fitch). *Aphidius granariaphis* Cook.

Parasitic on *Macrosiphum cerealis* and *Siphocoryne avenæ.* West Haven, 27 June, 1905 (H. L. V.).

°**A. (A.) ribis** Haliday.

Parasitic on *Myzus ribis.*

Cymodusa Holmgren.

Limneria Cresson (in part).

C. distincta (Cresson).

Female and male: length 7 mm.; flagel yellowish at base on the inner side; hind coxæ only black, hind tibiæ without whitish annuli; dorsal abdominal segments beyond the third reddish, except the sixth, which is mostly black or blackish; petiole without a fossa on each side.

Scotland, 10 August, 1905 (B. H. W.); Colebrook, 27 July, 1905, Cheshire, 8 July, 1904, New Haven, 4 July, 1905 (H. L. V.); Stonington, 16 May, 1906 (W. E. B.).

Sagaritis Holmgren.

Limneria Cresson (in part).

Greatest diameter of lateral ocelli as long as or longer than the ocellocular line.

Key to Species.

1. Hind coxæ black above and beneath as well as elsewhere.... 2
   Hind coxæ reddish or brownish beneath ....**conjunctiformis**
2. Hind tibiæ without whitish annuli, at most with a yellowish stripe; petiole cylindrical, without a depression above on each side between petiole and postpetiole, the latter rather oblong 3
   Hind tibiæ with whitish annuli, fore and mid coxæ mostly pale, stramineous or reddish stramineous ....**aprilis**
3. Abdomen not entirely black above ....**provancheri**
   Abdomen entirely black above ....**patsuiketorum**

S. provancheri Dalla Torre. *S. dubitatus* (Cresson).

Colebrook, 21 July, 1905, at flowers of water hemlock (*Cicuta maculata*); Branford, 28 July, 1905; New Haven, 26 June, 1905 (H. L. V.), 8 June, 1904 (W. E. B.); Southington 5 July, 1905.

***S. conjunctiformis** Viereck (new species).

Type locality: New Haven, 19 July, 1905 (B. H. W.); Branford, 28 June, 1905 (H. W. W.), 23 June, 1904 (at flowers of willow), 4 July, 1905 (H. L. V.).

***S. patsuiketorum** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.). Also from the type locality, 15 July, 1904 (W. E. B.); and from Milldale, 21 May, 1906 (B. H. W.).

*__S. aprilis__ Viereck (new species).

Type locality: New Haven, 27 April, 1907 (W. E. B.), 9 May, 1911 (A. B. C.).

Campoplex Gravenhorst.

Limneria Cresson (in part).

Key to Species.

1. Greatest diameter of lateral ocelli as long as or longer than ocellocular line; head not quadrate, outside line of temples not nearly attaining plane of outside line of eyes; propodeum more or less channeled 2

Greatest diameter of lateral ocelli distinctly shorter than ocellocular line; propodeum not channeled.............. 3

2. Hind coxæ reddish; abdomen mostly reddish above .... **grossulariflorae**

Hind coxæ black; abdomen entirely black above ....**nolae**

3. Abdomen not entirely black above........................ 4

Abdomen entirely black above ....**maquinnai**

4. Postpetiole black at apex, apical third of second segment stramineous, rest of third segment almost entirely rather blackish, and fourth dorsal abdominal segment stramineous on basal third ....**pentagoetorum**

Postpetiole apically, apical half of second, most of third and base of fourth dorsal abdominal segments, reddish **polychrosidis**

*__C. (Campoplex) pentagoetorum__ Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.).

*__C. (C.) maquinnai__ Viereck (new species).

Type locality: Milldale, 21 May, 1906 (B. H. W.).

*__C. (C.) grossulariflorae__ Viereck (new species).

Type locality: New Haven, 14 May, 1904 (H. L. V.), on flowers of gooseberry (*Ribes oxyacanthoides*).

C. (C.) nolae (Ashmead).

Cheshire, 8 July, 1904 (H. L. V.).

°**C. (C.) polychrosidis** Viereck.

Reared from *Polychrosis carduiana* and *Platyptilia carduidactyla* by W. D. Kearfott.

Subgenus **Bathyplectes** (Foerster) Szepligeti.

*__Campoplex (B.) etemankiakorum__ Viereck (new species).

Antennæ black or blackish throughout; all coxæ black or blackish, hind tibiæ without white annuli; second and third dorsal abdominal segments with an apical reddish band.

Type locality: West Haven, 27 June, 1905 (H. L. V.). Also from New Haven, 6 July, 1904 (H. L. V.).

Subgenus **Hypothereutes** (Foerster) Ashmead.

Key to Species.

Nervellus not angulate; hind coxæ reddish; basal area trapezoidal, areola not parallel-sided; hind tibiæ with whitish annuli; abdomen without a median longitudinal black band; abdomen black above, except apical half of second segment, apical two-thirds of third segment and an apical band on fourth segment, which are more or less reddish **vernalis**

Nervellus angulate; hind coxæ reddish; hind tibiæ with whitish annuli; abdomen black above, except thyridia which are brownish, apical margin of second segment which is stramineous, and a spot on each side of third segment which is rather reddish ....**elyi**

***Campoplex (H.) vernalis** Viereck (new species).

Type locality: New Haven, 24 May, 1905 (W. E. B.).

***C. (H.) elyi** Viereck.

Type locality: East River, 30 July, 1910 (Charles R. Ely).

Subgenus **Holocremnus** (Foerster) Dalla Torre.

***Campoplex (H.) metacomet** Viereck (new species.)

Hind coxæ only black, hind tibiæ without whitish annuli; second and third dorsal abdominal segments with an apical reddish band, and all or nearly all of the succeeding segments reddish.

Type locality: New Haven, 22 June, 1905 (W. E. B.). Taken on a window.

Subgenus **Angitia** Holmgren.

Limneria Cresson (in part).

Key to Species.

1. Abdomen black throughout above; scape mostly dark brown to blackish beneath 2

Abdomen not black throughout above 4

2. Costulæ more or less distinct and complete................. 3

Costulæ virtually wanting; hind tibiæ rather uniformly stramineous; ocelloccipital line hardly longer than postocellar line ....**macer**

3. Hind coxæ black, hind tibiæ with whitish annuli; scape dark brownish, with pale tip; propodeum rather coarsely sculptured .... **parviformis**
Hind coxæ reddish, hind tibiæ without whitish annuli; scape with a yellowish tip .... **openangorum**
4. Hind coxæ mostly black or blackish..................... 5
Hind coxæ mostly reddish; scape mostly dark brownish; hind tibiæ without whitish annuli; eyes, at least in female, not converging below 7
5. Eyes not converging below; abdomen mostly black.......... 6
Eyes converging below; scape pale beneath ....**obscurus**
6. Scape yellowish beneath; areola and petiolarea confluent .**kiehtani**
Scape blackish throughout; areola and petiolarea not confluent .... **woonandi**
7. Spiracles of first abdominal segment protuberant; thyridia black .... **œdemisiformis**
Spiracles of first abdominal segment not protuberant; thyridia reddish .... **ruficoxa**

Campoplex (A.) macer (Cresson).

Poquonock, 27 June, 1905; Cheshire, 8 July 1904 (H. L. V.).

*C. (A.) **openangorum** Viereck (new species).

Type locality: Thompson, 11 July, 1905 (H. L. V.). Also from New Haven, 27 June, 1905 (W. E. B.), taken from breeding cage containing infested gooseberries.

*C. (A.) **woonandi** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.).

*C. (A.) **œdemisiformis** Viereck (new species).

Type locality: East Hartford, 2 August, 1905 (B. H. W.). Also from West Haven, 27 June, 1905 (H. L. V.).

°C. (A.) **obscurus** Cresson.

This is another American species recorded as a parasite of the cosmopolitan insects, *Plusia brassicæ* and *Plutella cruciferarum.*

*C. (A.) **kiehtani** Viereck (new species).

Type locality: Orange, taken on 27 January, 1906, from jar containing corn infested with *Plodia interpunctella,* from Woodruff's storehouse, 17 November, 1905 (W. E. B.).

*C. (A.) **parviformis** Viereck (new species).

Type locality: North Haven, 3 August, 1905 (H. L. V.).

C. (A.) **ruficoxa** (Provancher).

West Haven, 27 June, 1905 (H. L. V.).

Subgenus **Dioctes** (Foerster) Schmiedeknecht.

Limneria Cresson (in part).

°**Campoplex (D.) obliteratus** (Cresson).

Length 5 mm.; mouth, tegulæ, fore and mid coxæ and trochanters, and abdomen beneath, yellowish; legs mostly stramineous.

Subgenus **Nepiera** (Foerster) Thomson.

***Campoplex (N.) amasecontorum** Viereck (new species).

Hind coxæ only black; hind tibiæ without white annuli; an apical reddish margin on the first and second dorsal abdominal segments; basal third (approximately) of the third dorsal segment black, the rest reddish, nearly all of the fourth dorsal segment reddish.

Type locality: New Haven, 4 July, 1905 (H. L. V.).

Subgenus **Ameloctonus** (Foerster) Ashmead.

Limneria Cresson (in part).

Key to Species.

1. Abdomen more or less reddish; hind coxæ reddish above.... 2
 Abdomen black throughout above 4
2. Petiole black at base 3
 Petiole reddish at base ....**pallipes**
3. Propodeum finely sculptured, its carinæ distinct ....**clisiocampæ**
 Propodeum coarsely sculptured, its carinæ indistinct ....**pilosulus**
4. Hind coxæ reddish or stramineous......................... 5
 Hind coxæ black; hind tibiæ and metatarsi with whitish annuli ....**annulipes**
5. Hind tibiæ with a whitish annulus at base................. 6
 Hind tibiæ without a whitish annulus at base; lateral longitudinal carinæ well developed ....**acronyctæ**
6. Basal area triangular ....**fugitivus**
 Basal area quadrangular ....**œdemisiæ**

Campoplex (A.) clisiocampæ (Weed).

Length 4 to 5 mm.; greatest diameter of lateral ocellus as long as or longer than the ocellocular line; scape and pedicel yellowish in front, mandibles mostly yellowish, palpi whitish; tubercles, tegulæ, wing bases, and most of fore and mid legs, more or less yellowish; legs, including hind coxæ, mostly reddish in the female; propodeal carinæ well developed, areola and petiolarea confluent; postpetiole wider at base than long on each side; postpetiole in the female black at base, apically reddish like most of the rest of the abdomen; male with the hind coxæ yellowish, and the abdomen reddish with more or less extensive black stains except the first segment, which is mostly black; mid femora reddish in the female, yellowish in the male.

Parasite of *Malacosoma americana*, the American tent-caterpillar.

New Haven, 12 April, 1911 (A. B. C.).

C. (A.) **fugitivus** (Say).

Hosts of this species are the Io moth (*Hyperchira io*), *Hyphantria textor*, (*Clisiocampa*) *Malacosoma americana*, the forest tent-caterpillar (*M. disstria*), (*Pyrameis*) *Vanessa cardui*, (*Apatura*) *Chlorippe celtis*, (*A.*) *C. clyton*, *Pholisora catullus*, *Euchætes egle*, *Hemileuca maia*, the Bombycids *Anisota rubicunda*, *A. senatoria*, *A. stigma*, *A. virginiensis*, the Microlepidopteron *Mineola indigenella* and *Ephestia kuehniella*.

The many destructive secondary parasites that attack this species tend to impair its usefulness; in spite of these, however, it is a very useful insect.

°C. (A.) **annulipes** (Cresson).

Recorded as a parasite of *Plutella cruciferarum*.

C. (A.) **pilosulus** (Provancher).

New Haven, 8 August, 1905 (W. E. B.).

°C. (A.) **acronyctæ** (Ashmead).

Parasite of *Apatela oblinita*.

C. (A.) **œdemisiæ** (Ashmead).

Parasite of the red-humped apple tree caterpillar, *Schizura concinna*, from which it was reared 22 September, 1905, New Canaan (B. H. W.).

°C. (A.) **pallipes** (Provancher).

Subgenus **Hyposoter** (Foerster) Viereck.

***Campoplex** (H.) **diversicolor** Viereck.

Female: length 5.5 mm.; lateral ocelli nearer the eye than the anterior ocellus; clypeus mostly yellowish; scape uniformly dark stramineous in front, pedicel paler in front than the scape; fore and mid coxæ yellowish, hind legs with coxæ, trochanters and femora more or less reddish, their tibiæ reddish brown, pale at base, with a subbasal and subapical dark brown band, their tarsi dark brown; basal area rather petiolate triangular; abdomen black and reddish.

Type locality: East River, reared from a larva on hickory, 7 July, 1910 (Charles R. Ely).

Casinaria Holmgren.

Key to Subgenera.

1. Propodeum apparently not extending to the middle of hind coxæ 2

Propodeum apparently extending to or beyond middle of hind coxæ, but not to apex; second dorsal abdominal segment not longer than first 4

2. Areolet present 3

Areolet wanting; thorax elongate; postpetiole nearly as long as petiole, the latter with a distinct fossa on each side **Pseuderipternus** p. 269

3. Thorax succinct, mesothorax with its vertical axis distinctly greater than the horizontal axis; nervulus not interstitial, nervellus neither branched nor angulated, recurrent vein received before middle of areolet; hind edge of sides of mesonotum without a foramen; second dorsal segment compressed ....**Campoplegidea**

Thorax elongate as in *Pseuderipternus*, vertical axis distinctly shorter than horizontal axis ....**Pseuderipternoides** p. 269

4. Head lenticular, vertical or almost vertical between hind ocelli and occipital carina; temples along upper fourth of eye, as seen in profile, extending beyond hind edge of eye; clypeus hardly separated from face; areolet present; mesosternum without a process on each side of mesosulcus or median longitudinal channel............................ 5

Head not lenticular, obliquely sloping between hind ocelli and occipital carina; clypeal foramina rather distinct.... 6

5. Second abscissa of discoidal vein longer than third; propodeal spiracles almost round; clypeal foramina barely visible ....**Amorphota** p. 269

Second abscissa of discoidal vein as long as or shorter than third; propodeal spiracles slit-like; clypeal foramina invisible ....**Pseudocasinaria** p. 270

6. Propodeal spiracles round or oval, not slit-like, propodeum virtually exareolate 7

Propodeal spiracles slit-like 8

7. Petiole with a fossa on each side near the postpetiole; discoidal vein of hind wings present ....**Campoplegidea**

Petiole without a fossa on each side near the postpetiole;

second abscissa of discoidal vein nearly as long as third; nervellus angulate or strongly curved below middle; discoidal vein of hind wings wanting ....**Viereckiana** p. 271

8. Second abscissa of discoidal vein as long as or shorter than third 9

Second abscissa of discoidal vein longer than third 10

9. Propodeum virtually exareolate ....**Viereckiana** p. 271

Propodeum areolated; eyes not distinctly converging below, not hairy; areolet present ....**Idechthis** p. 270

10. Nervellus not angulated ....**Neonortonia** p. 271

Nervellus angulated or branched below middle ..**Casinaria** p. 270

Subgenus **Pseuderipternus** Viereck (new subgenus).

Podogaster Provancher, not Brullé. *Limneria* Cresson (in part).

Casinaria (P.) radiolata Provancher. *Eripternus primus* Ashmead MS.

Female: length 7.5 mm.; black; clypeus, mandibles and palpi reddish; wings hyaline, veins blackish; legs red except mid and hind coxæ, their trochanters and the hind tarsi, which are black or blackish; abdomen with third, fourth and fifth segments red except at base above; exserted portion of ovipositor 4.2 mm. in length.

Stratford, 21 July, 1908 (W. E. B.).

Subgenus **Pseuderipternoides** Viereck (new subgenus).

Limneria Cresson (in part).

Type: *Limneria porrecta* (Cresson).

Casinaria (P.) porrecta (Cresson).

Black; most of mandibles, palpi and tegulæ yellowish; legs reddish; abdomen reddish and blackish, especially black or blackish at base and apex; all coxæ reddish or pale.

Colebrook, 21 July, 1905 (H. L. V.), on flowers of water hemlock (*Cicuta maculata*); Woodmont, 9 July, 1904 (P. L. B.).

Subgenus **Amorphota** (Foerster) Howard.

°**Casinaria (A.) orgyiæ** Howard.

Hind tibiæ without whitish annuli; all coxæ mostly reddish or pale; abdomen above mostly reddish, disk and apical border of second segment black.

Parasitic on the white-marked tussock moth (*Hemerocampa leucostigma*).

Subgenus **Casinaria** Holmgren.

***Casinaria (C.) eupitheciæ** Viereck.

Greatest diameter of lateral ocellus distinctly longer than ocellocular line; scape and pedicel more or less pale beneath; coxæ mostly black, rest of legs mostly pale or reddish; dorsal abdominal segments almost entirely black.

Type locality: East River, 27 August, 1910, 8, 10 September. 1910; reared from *Eupithecia miserulata* by Charles R. Ely; Scotland, 10 August, 1905 (B. H. W.); Cheshire, 8 July, 1904; Colebrook, 21 July, 1905 (H. L. V.).

***C. (C.) scabriformis** Viereck.

Scape and pedicel yellow beneath; fore and mid coxæ reddish stramineous, hind coxæ black; an apical reddish margin on the second dorsal abdominal segment, and apical half of third dorsal segment reddish; remaining dorsal segments reddish throughout.

East River, 10 September, 1910, reared from *Eupithecia miserulata* by Charles R. Ely.

Subgenus **Idechthis** (Foerster) Ashmead.

***Casinaria (I.) sokanakiakorum** Viereck (new species).

First dorsal abdominal segment black, apex of second abdominal segment with a reddish band, third to sixth dorsal abdominal segments laterally partly brownish or reddish brown; scape in front, fore and mid coxæ, and all trochanters, yellow; hind coxæ only black, hind tibiæ without whitish annuli.

Type locality: New Haven, 4 July, 1905 (H. L. V.).

Subgenus **Pseudocasinaria** Viereck.

Casinaria Ashmead.

***Casinaria (P.) ceanothi** Viereck (new species).

Body 7.5 mm. long. Male: scape and pedicel pale brown, flagel black; head black; mandibles yellow, tipped with brown, palpi whitish; thorax black, wings transparent, tinted with brown, veins dark brown; fore and mid coxæ black at base, rest brownish, hind coxæ black, brownish at apex, trochanters mostly yellowish, femora mostly brownish stramineous to brown, tibiæ stramineous to brownish stramineous, more or less whitish or yellowish white posteriorly, fore and mid tarsi yellow, hind tarsi brown; abdomen mostly reddish; constricted portion of first segment, baasl three-fourths of second, and greater part of basal half of third dorsal segment, black or blackish.

Type locality: New Haven, 6 July, 1904 (P. L. B.), on flowers of New Jersey tea (*Ceanothus americanus*).

Subgenus Neonortonia Viereck.

Limneria Cresson (in part). *Campoplex* Cresson (in part).

***Casinaria (N.) genuina** (Norton).

Female and male: length 9 mm.; black; legs stramineous; body sericeous, with white hair; palpi yellowish, face scarcely narrowed below antennæ, ocelli ruby-colored or pale; smooth space beneath wings with fine curved striæ; coxæ and trochanters black, apical joints of tarsi blackish; wings hyaline; male with the white hairs on the face shorter than in the opposite sex.

Subgenus Viereckiana Strand (*Anisitsia* Viereck, preoccupied.)

Campoplex Cresson (in part).

***Casinaria (A.) vitticollis** (Norton).

Female: length 15 mm.; prevailing color of thorax reddish, with a black stripe; antennæ reddish at tip and at base, eyes scarcely contracted below, head black, mandibles, palpi and tegulæ yellow, tips of mandibles dark, face and thorax covered with silvery hair; black stripe on thorax extending nearly all the way from the head to the base of the propodeum, being interrupted only by the scutel, which latter is rufous at its apex; abdomen mostly reddish, a line on the second dorsal segment, sheaths of the ovipositor and the under surface of the abdomen itself, black; fore legs, tips of mid femora and legs below, and bases of hind tibiæ, yellow; a line on fore femora above, mid coxæ, trochanters and femora, hind coxæ, trochanters, bases of femora beneath, and tarsi, black; mid and hind coxæ above, their femora and apices of their tibiæ mostly reddish; wings yellowish hyaline, veins dark.

New Haven, 22 August, 1904 (P. L. B.).

C. (A.) villosa (Norton).

Female and male: length 16 mm.; black, with the metathorax and abdomen reddish; antennæ piceous beneath, a longitudinal median ridge extending between the ocelli and the antennæ; head and thorax covered with silvery hair, which is longest on the face and propodeum; a spot on the mandibles, palpi and tegulæ, yellow; a triangular area below the hind wings, the propodeum, except at its summit, hind coxæ above, and first abdominal segment ruby red, rest of abdomen reddish, a black line on the second segment; a spot on fore coxæ, the fore and mid legs and hind tibiæ in the middle, yellow; a line on fore femora above, mid coxæ and most of femora and hind legs, black; wings hyaline.

New Haven, 24 July, 1904 (P. L. B.).

Species Incertæ Sedis, or species the exact position of which in modern classification is unknown.

***Casinaria assita** (Norton).

Female: length 10 mm.; black, abdomen partly rufous; antennæ piceous; face narrowed below the antennæ, head and sides of thorax with sparse white hair; mandibles piceous at tip; basal and second abdominal segments, except the tip above, black; segments of apical portion of abdomen with black above; legs black, fore pair yellow beneath below the coxæ, the middle pair with a spot on the femora above and the tibiæ yellow, all tarsi with whitish ends; wings faintly clouded.

Type locality: Farmington.

***C. glauca** (Norton).

Female: length 11 mm.; black; abdomen rufous; a large reddish spot on mandibles; palpi pale; head and thorax covered with short whitish hairs that are not silvery; tegulæ yellowish; basal half of first abdominal segment, a spot on second segment above, and the sheaths of the ovipositor, black; the fore and mid legs with yellow tibiæ and tarsi, reddish toward base; hind legs ferruginous; all coxæ, trochanters, and the hind tibiæ and tarsi above, dark piceous shading into reddish; wings hyaline.

Type locality: Farmington.

***C. diversa** (Norton).

Female and male: length 12.5-13.5 mm. Female: black, abdomen partly rufous; like *argentea* as described below, except as follows: antennæ blackish only toward the tip; first abdominal segment and upper part of second nearly to its apex, black, hind tarsi blackish. Male with the ultimate and penulti-darkest toward end; legs with more of black at base, fore coxæ black, hind tarsi blackish. Male with the ultimate and penultimate abdominal segments black, and the fore and mid legs entirely or mostly yellow .

***C. argentea** (Norton).

Female: length 16 mm.; black, with abdomen rufous except at base; flagel of antennæ dark piceous, basal joint yellow beneath (in some cases blackish or black); lower half of face and most of thorax covered with silvery white hair; mandibles, except tips, palpi and tegulæ, yellow; second abdominal segment above and sheaths of ovipositor black, rest of abdomen rufous, more or less mottled with black, second segment beneath yellow or yellow-rufous; hind tibiæ and spines and the fore and mid legs yellow except a line on the fore femora in front, the mid coxæ and two-thirds of the femora, which, together with the hind legs, are black; wings smoky hyaline.

Paracanidia Viereck.

***P. elyi** Viereck.

This is a slender black species with the abdomen partly reddish and the antennæ annulated with pale yellow.

Type locality: East River, July, 1910 (C. R. Ely).

Ceratogastra Ashmead.

Ceratosoma Cresson.

C. fasciata Cresson.

Length 12 mm.; blackish; face, cheeks, mandibles, and palpi mostly yellow; antennæ pale to dark brown; tegulæ, a spot on each side of the dorsulum, a mark on the mesopleuræ, tubercles, scutel, postscutel, a mark on the propodeum, a mark on the metapleuræ, and a stripe on the middle and hind coxæ, more or less yellow; coxæ mostly brown; rest of legs mostly yellow, tinted with brown, except the hind femora and apical half of hind tibiæ, which are mostly brown; wings brownish, with a yellowish tint, stigma and costa yellowish brown, veins brown, fore wings whitish along part of each of the following veins: second transverse cubitus, cubitodiscoidal, and second recurrent; abdomen with its dorsal segments more or less broadly banded with yellow apically; ovipositor not exserted; dorsulum sometimes with four yellow spots.

Rockville, 23 August, 1905 (H. L. V.).

Exetastes Gravenhorst.

Key to Species.

1. Length 12 mm. 2

Length 10.5 mm.; answers fairly well to description of *fascipennis* as given below, except as follows: scutel yellow, wings almost uniformly brownish, with a yellowish stigma; antennæ uniformly brownish; exserted portion of ovipositor nearly one-half length of hind tibiæ .... **scutellaris**

2. Reddish with blackish sutures to thorax and a brownish tip to hind tibiæ; antennæ brown, with a yellow annulus involving more or less of joints nine to fourteen inclusive; wings yellowish, transparent, tinted with brown, a broad yellowish band extending from anterior to posterior margins of fore wings and originating at basal half of stigma; exserted portion of ovipositor as long as hind coxæ **fascipennis**

Male: black, except eyes, which are steel-color in death; antennæ brownish; wings transparent brownish, fore and mid femora mostly, and all tibiæ and tarsi, lemon-yellow. Female similar to male .... **suaveolens**

°E. **scutellaris** Cresson. Howard, Insect Book, Pl. ix, Fig. 17.

°E. **fascipennis** Cresson. Howard, Insect Book, Pl. x, Fig. 7.

°E. **suaveolens** Walsh.

Pristomerus Curtis.

*P. **olamonus** Viereck (new species).

Female: 3.5 mm. long; head in front mostly brownish, behind mostly black or blackish, as is the thorax; abdomen above mostly brown; abdomen beneath and legs mostly brownish stramineous; antennæ mostly blackish, their scape and pedicel brown; sheaths of the ovipositor blackish, exserted portion of the latter nearly as long as the abdomen; orbits reddish and yellowish brown; notauli, space between them on the posterior half of the dorsulum, scutel, and propleuræ, more or less brown, tegulæ yellowish.

Type locality: Rockville, 23 August, 1905 (H. L. V.).

Porizon Fallen.

Thersilochus Holmgren.

P. conotracheli Riley.

Length 3.5 mm.; head and thorax mostly black; abdomen mostly castaneous; mandibles brownish, scape and pedicel light brown; flagel very dark brown; legs brownish stramineous; wings clear with a brownish tinge, stigma brownish stramineous, veins nearly concolorous with the stigma, the costa brown, the tegulæ stramineous; first abdominal segment mostly black or blackish, castaneous at and near the apex; exserted portion of the ovipositor nearly as long as the body, or approximately 3 mm.

Parasitic on the plum curculio.

New Haven, 14 May, 1904, on flowers of two species of gooseberry (*Ribes occidentalis* and *R. oxyacanthoides*) (H. L. V.).

Porizonidea Viereck.

Type: *Porizon exhaustator* (Fabricius).

P. sp.

New Haven, 4 July, 1905 (H. L. V.).

Orthopelma Taschenberg.

Proedrus Foerster.

O. diastrophi Ashmead.

Male and female: length 4 mm.; ovipositor 1.6 mm.; head and thorax black; legs, including coxæ, and abdomen, reddish; base of second dorsal segment and all sutures stramineous, the apex more or less dusky, the petiole black; antennæ dark brown, their first, second and third joints paler; clypeus, mandibles, and palpi reddish; wings hyaline, stigma and veins brown; in the male the first and second antennal joints reddish.

Reared from galls of *Diastrophus radicum* in Waterbury.

Plectiscidea Viereck.

Plectiscus Authors, not Gravenhorst.

Type: *Plectiscus collaris* Gravenhorst.

Key to Species.

Clypeus strongly elevated and with a beak-like projection in female; abdomen rugose, sessile, basal segment without a distinct furrow above; wings without an areolet; length 4 mm. (female, male); black; mesonotum, sternum, pleuræ, scutel, front, and clypeus, pale rufous varied more or less with white; a narrow annulus toward apex of antennæ in female; orbital lines, cheeks, mouth-parts, and venter, white; legs blackish stramineous varied with white; wings hyaline, veins and stigma pale yellow; exserted portion of ovipositor 1 mm. long .... nasuta

Clypeus not strongly projecting; wings with an areolet; face not narrowed below; propodeum areolated; clypeus arched and somewhat compressed at sides; suture between face and clypeus represented only by a crease; length 6 mm. (female); black, with face, cheeks, mouth-parts, tegulæ, fore and mid coxæ and trochanters, bases of hind tarsi, spot at base on each side of second abdominal segment, median stripe from middle of second dorsal segment to apex of third segment, and abdomen beneath, white; sternum and pleuræ reddish, stigma reddish, legs pale rufous, with hind tibiæ black at apex; exserted portion of ovipositor about one-fourth as long as abdomen .. pleuralis

P. (Aperileptus?) contentionis Viereck (new species). *Mesoleptus rufipes* Cresson, not Provancher.

Female: body 7 mm. long; exserted portion of ovipositor 3 mm. long; head and thorax mostly smooth and polished; first, second, and third dorsal abdominal segments granular, dullish; segments beyond shining, minutely, shallowly punctate rather than granular; metathorax shining but roughened, especially the sides, which are rather wrinkled; dorsal aspect of metathorax separated from posterior aspect by a carina, the posterior aspect excavated and polished smooth, dorsal aspect separated into three practically equal longitudinal areas by two almost parallel raised lines; metapleuræ practically confluent (i.e., not separated by a distinct raised line) with the fused lateral areas of the metanotum; antennæ 25-jointed; mouth-parts, scape, and pedicel mostly testaceous, rest of antennæ and face mostly brown; thorax mostly black; scutel and postscutel yellow; tubercles and tegulæ yellowish; legs yellowish testaceous to reddish testaceous; abdomen above black, except for the sutures, which are more or less brown or bordered with brown or testaceous.

Type locality: New York State. Also from Connecticut.

°**P. pleuralis** Provancher.

°**P. (Campothreptus) nasuta** Cresson.

Cremastus Gravenhorst.

Key to Species.

Male: head brown; face, orbits, clypeus, mandibles, and palpi, yellow; middle of face clouded with fulvous; antennæ black, scape beneath dull reddish; thorax dull yellowish brown; lobes of mesothorax darker medially, prothorax yellow, scutel dark yellowish; propodeum black; metapleuræ shading into brown; tegulæ yellow; wings hyaline, veins fuscous; legs yellowish varied with brown, especially hind pair; tips of hind tibiæ blackish; abdomen with its first and second dorsal segments as well as corresponding ventral segments, yellow, the remaining segments reddish, with a black spot at base above .... **retiniæ**

Female: length 6-7 mm.; black; clypeus, mandibles, palpi, maxillæ, and upper two-thirds of orbits, yellow; antennæ piceous, yellowish brown beneath near their bases; hind margins of dorsal abdominal segments behind second sometimes brownish; venter yellowish; exserted portion of ovipositor two-thirds as long as abdomen; fore and mid legs, including coxæ, light yellow with dusky tarsi; hind legs dull yellowish red, with coxæ, except at tips, and basal portion of trochanters, black; tarsi dusky; tegulæ and veins at base of wings whitish yellow, rest of veins and stigma, except a whitish spot at base of latter, pale brown .... **cooki**

°**C. retiniæ** Cresson. *Temelucha retiniæ* Ashmead.

Parasitic on the tortricid known as the pitch-pine Retinia (*Retinia rigidana*), inhabiting the terminal shoots of the pitch pine (*Pinus rigida*).

°**C. cooki** Weed. *Temelucha cookii* Ashmead.

Parasitic on the strawberry leaf-roller (*Ancylis comptana*). Its host is common in Connecticut.

Mesochorus Gravenhorst.

Key to Species.

1. Thorax almost entirely or entirely black; vertex and occiput black; orbits yellowish 2
   Thorax not colored as in preceding category 3
2. Front below antennæ bright yellow, with a slight reddish tinge down its middle; palpi stramineous; antennæ brown, pale yellowish at base; second antennal joint pale brown above, third yellow, fourth and fifth pale yellowish brown; tegulæ and base of wings greenish yellow, wings otherwise

clear except stigma, which is brown, and veins, which are concolorous with stigma; legs, including coxæ, stramineous; tarsi of fore and mid legs, near claws, dusky; tarsi of hind legs a little dusky except on basal two-thirds of first joint, darkest near claws; abdomen black, with a yellowish band in middle, posterior edge of second and anterior two-thirds of third dorsal segment, yellow; ovipositor not quite as long as abdomen is wide; body 4 mm. long .... pieridicola

Front below antennæ mostly blackish, antennæ brownish throughout; tegulæ brownish stramineous; base of wings yellowish; legs brownish stramineous, tips of hind femora concolorous with remainder of this member and without an annulus of brown, which latter, however, exists at tips of the hind tibiæ; abdomen black, except a pale, seemingly yellowish, apical edge to the dorsal segments; exserted portion of ovipositor a little longer than greatest width of abdomen; length of body 3 mm.; otherwise about the same as in description of *pieridicola* as detailed above calais

3. Thorax mostly black or rufous 4

Thorax mostly yellow or marked with yellow-brown, or mostly yellow-stramineous, or mosty stramineous........ 5

4. Thorax mostly reddish; eyes and ocelli black, antennæ fuscous, except toward their bases; upper surface of thorax fuscous in some individuals; hind knees slightly dusky, tips of hind tibiæ distinctly dusky; wings hyaline, veins and stigma dusky; abdomen translucent, yellowish white in its central third, remaining two-thirds piceous black, with a distinct, narrow, yellowish annulus at base of third dorsal segment; or basal abdominal joint and articulations of apical third of abdomen light reddish; head in addition mostly reddish; head of female from mouth up, piceous; male with its thorax piceous black; ovipositor dusky, its exserted portion slightly longer than greatest width of abdomen. Length of body 2-3 mm. .... vitreus

Thorax mostly black; scape and pedicel, face below antennæ, lower half of cheeks, tegulæ, extreme bases of front wings, part of collar or pronotum, legs, including coxæ (except a brownish annulus at tips of hind femora), and apical edge of second dorsal abdominal segment, more or less yellow or yellowish; parts of head not mentioned above, black; third dorsal abdominal segment mostly brownish yellow; abdomen beneath mostly pale brownish; exserted portion of ovipositor not quite as long as greatest width of abdomen and yellow in color; wings practically colorless, stigma and veins brownish. Length 3.5-4 mm. ....luteipes

5. Thorax marked with brownish above, or only partly brownish above 6

Thorax unicolorous and brownish stramineous.............. 7

6. Female: 4.7 mm. long; exserted portion of ovipositor a little longer than second dorsal abdominal segment; head and antennæ, except ocellar region, which is black, mostly stramineous and brownish stramineous; thorax brownish, except dorsulum and propodeum, which are blackish; tegulæ, base of wings, legs, including coxæ, greater part of apical two-thirds of second dorsal abdominal segment and all of third dorsal abdominal segment, except apical margin of latter (which is blackish), yellow; dorsal abdominal segments beyond third brownish and brownish stramineous, petiole of abdomen mostly brownish stramineous; wings colorless, except stigma and veins, which are brownish; hind tibiæ with brownish tips ....americanus

Species not answering description of *americanus* as given above, in all particulars................................ 8

7. Male: head mostly concolorous with thorax, antennæ mostly brownish; legs almost entirely yellow-stramineous; abdomen mostly brown, its apical dorsal half blackish; wings faintly tinged with brown; stigma and veins brownish. Length 4.5 mm. ....melleus

Female: head and antennæ as in *melleus;* legs as in last-mentioned species, except hind tibiæ, which have apical fourth brown; size of body approximately as in *melleus;* abdomen with its dorsum mostly yellow, faintly tinted with brown, and its dorsal segments more or less margined with brown; ventral portion of abdomen brownish; wings as in *melleus* as described above; ovipositor nearly as long as first dorsal abdominal segment ....obliquus

8. About 2.5 mm. long; almost entirely yellowish stramineous, with the following exceptions: ocellar region and eyes black or blackish; dorsum of thorax partly brownish; dorsum of abdomen (except second and third dorsal segments, which are mostly yellow) mostly blackish or brownish; hind femora at apex and hind tarsi (partly) more or less brownish ....scitulus

Species related to *scitulus*, but answering the following description, at least in female: length 2.3-3 mm.; ovipositor exserted, pale honey-yellow or yellowish white, disk of dorsulum and propodeum reddish brown, the latter in some individuals black; tips of mandibles black; abdomen black, but with a luteous spot occupying most of second and third dorsal segments; a spot at base of hind tibiæ, and apex of the same, brown; wings hyaline, stigma and veins practically concolorous with the rest of the wing, or hyaline, except costa, which alone is slightly luteous .... aprilinus

*M. aprilinus Ashmead.

Reared from the cocoons of *Protapanteles congregatus* (Say).

*M. calais Viereck (new species).

Type locality: Yalesville, 19 October, 1903 (H. L. V.).

°M. pieridicola Packard.

The host of this species is questionably *Protapanteles congregatus* (Say).

°M. vitreus Walsh.

This is one of the American species hyper-parasitic on the army worm, (*Leucania, Heliophila*) *Cirphis unipuncta*.

°M. scitulus Cresson.

The secondary hosts of this insect are said to be the clouded sulphur butterfly, (*Colias*) *Eurymus philodice*, and the sphingid, *Smerinthus jamaicensis*.

°M. obliquus Cresson.

This species owes its name to the two oblique brown marks at the base of the second dorsal abdominal segment.

°M. melleus Cresson.

This is probably the male of the preceding species.

°M. americanus Cresson.

°M. luteipes Cresson.

Paniscus Gravenhorst.

P. geminatus Say. Pl. ix, Fig. 9; also Howard, Insect Book, Pl. x, Fig. 23.

Length 9-16 mm.; brownish stramineous; eyes slate-color in death; ocelli brown, antennæ brownish; wings hyaline, but with the stigma yellowish stramineous and the veins brownish; ovipositor, i.e., the exserted portion thereof, and the sheaths brown, the former a little longer than the metatarsus or first joint of the tarsi of the hind legs.

The records of this species in the collection of the Connecticut Agricultural Experiment Station of New Haven (gathered by W. E. B., H. W. W., B. H. W., P. L. B., and the writer) indicate that it occurs throughout the state. It has been taken in May, July, August, and September.

°**P. albotarsatus** Provancher.

Average length 9 mm.; similar to *geminatus*, except as follows: tarsal joints of a whitish hue (whence the name); exserted portion of ovipositor not quite as long as the second tarsal joint of the hind legs; antennæ stramineous.

Opheltes Holmgren.

The only species of this genus occurring in Connecticut is the following:

O. glaucopterus (Linnæus). Howard, Insect Book, Pl. x, Fig. 27.

Length 18-20 mm.; head blackish above, with the remainder thereof, including the antennæ, brownish stramineous; thorax black, except the tegulæ, which are stramineous, and the scutel, which is brownish stramineous; wings yellowish, the hind pair broadly margined with a faint fuscous cloud; legs brownish, except the coxæ, which are mostly blackish; abdomen reddish, barring the blackish apical third; ovipositor scarcely as long as the second joint of the hind tarsi; in some specimens more than the scutel is brownish or brownish stramineous.

Erigorgus (Foerster) Brischke.

Anomalon Authors, not Panzer.

Key to Species.

1. Length less than 25 mm. (see also description at end of this genus) 2

Length 25 mm.; colored like *lateralis* or very nearly so; propodeum with a deep, median, longitudinal channel......**relictus**

2. Length less than 20.5 mm. 3

Length 20.5 mm. (female); reddish, with clear wings; antennæ piceous, basal joints yellow, fourth and fifth joints blackish; head yellow, eyes reddish; summit and back of head black, a yellow orbital dot on each side of the ocelli; inner edge of mandibles piceous; front and base of mesothorax, apex of propodeum, sternum, apical half of first abdominal segment and second dorsal abdominal segment, black; sheaths of ovipositor yellow,clavate; fore legs, basal half of hind tibiæ, and tarsi yellow; hind coxæ reddish beneath and black above; trochanters, apex of femora and tibiæ black; tegulæ yellow; wings hyaline. . **hyalinus**

3. Length less than 20 mm. 4

Length 20 mm.; reddish; vertex mostly blackish; face mostly yellowish; sutures of thorax black; scutel yellowish; apical fourth of abdomen mostly blackish; hind coxæ and their proximal trochanters mostly blackish; hind tibiæ brown, with apical third mostly blackish; hind tarsi with basal joints yellowish; wings transparent, with a yellowish tinge; antennæ pale brown; ovipositor not much longer than face is wide; propodeum without a deep, median, longitudinal channel .... **lateralis**

4. Length less than 19 mm. 5

Length 19 mm. (male); black; abdomen reddish, spotted with yellow and black; antennæ piceous, black at tips and bases above (yellow beneath); face below antennæ and a narrow line back of eyes, mandibles, and palpi, yellow; scutel black; first, second, and part of third and fourth segments of abdomen rufous, a black line on summit of second, sides of third and fourth segments black, spotted with yellow; fore and mid legs yellow; hind coxæ, spot on trochanters, femora, and apex of tibiæ, black; a spot on tip of coxæ beneath, trochanters, base of tibiæ and tarsi, yellow; tarsi blackish above; wings hyaline; tegulæ and basal half of costa yellowish; stigma piceous................ **curtus**

5. Length less than 18 mm. 6

Length 18 mm. (female); reddish and black; third antennal joint as long as fourth and fifth together; color piceous, darkest toward tip; basal joint reddish, as are some of the succeeding joints; head reddish; eyes converging beneath head; face below antennæ yellow; edge of clypeus, labrum and mandibles reddish; scutel yellow; sides of mesothorax, a dot behind scutel, propodeum above, a stripe curving from tegulæ to base of pleuræ, and abdomen, reddish; rest of thorax, a line above second dorsal abdominal segment and on sides of apical and four preceding abdominal segments, black; sheaths of ovipositor yellow; fore and mid legs, hind trochanters and tarsi, yellow; all coxæ, mid femora above, hind femora and tibiæ reddish; hind trochanters in part, and apex of tibiæ black; femora and tips of tarsi above, blackish; wings faintly smoky; tegulæ yellowish; stigma and costa reddish..................... **semirufus**

6. Length less than 17 mm. 7

Length 17 mm. (female); differs from *lateralis* as follows: wings with blackish tinge; antennæ dark brown; mid legs almost exclusively yellow or yellowish stramineous; apical half of abdomen black or blackish; also in exserted portion of ovipositor being not quite as long as face of this species is broad. Abdomen may be of a brownish hue and mid legs partly brownish; basal area of propodeum rather wider than long ....**analis**

7. Length less than 15 mm. 8

Length 15 mm. (male); black and reddish, yellow beneath; antennæ reddish, sides of first joint, second and fourth above and at apex, black; basal joint above and below, and second and fourth beneath, yellow; head yellow, ocelli ruby-colored, a black spot on vertex (enclosing ocelli, with a yellow dot on each side) extending down on the occiput; mesothorax, apex of propodeum and part of pleuræ, black; tegulæ, scutel, front of pleuræ and sternum, yellow; prothorax, space below scutel, base of propodeum and abdomen, pale reddish; line above second segment and apex of abdomen black; fore and mid legs, hind coxæ, trochanters and tarsi, yellow; a spot on hind coxæ and trochanters above and apical half of tibiæ, black; femora and bases of tibiæ rufous; wings hyaline; stigma pale **luteopectus**

8. Length less than 13 mm. 9

Length 13 mm. (female); black and reddish; face yellow, cheeks behind eyes reddish, vertex and occiput black; scape yellow below, black above; fore and mid legs yellow; hind coxæ, femora, and tibiæ black, with a rufous spot on coxæ, their femora with a varying amount of the same color; wings perfectly hyaline, veins dark brown; abdomen with first and second segments black (slightly rufous below); remainder of abdomen reddish ....**pseudargioli**

9. Length less than 12 mm. 10

Length 12 mm.; honey-yellow, with sternum black; antennæ reddish, second joint above, base of fourth, and joints of apical portion of antennæ, blackish; joints of basal portion of antennæ yellow beneath; a spot enclosing ocelli and touching antennæ, and a spot on back of head, black; face below antennæ and the cheeks yellow; a spot on prominent lobe of mesothorax, sutures about scutel, and ultimate and penultimate segments of abdomen above, black; other abdominal segments darkest above; fore and mid coxæ and trochanters, anterior legs, and mid and hind tarsi at base, yellow; remainder of legs reddish; wings hyaline, veins black. In the male, the vertical spot is larger than in the female, and the lower half of pleuræ and the summit and sides of propodeum are black **prismaticus**

10. Length less than 11 mm. 11

Length 11 mm.; in color like the variety of *analis*, with apical fourth of dorsum of abdomen mostly blackish; basal area of propodeum about twice as long as wide............**rufulus**

11. Length 10 mm.; antennæ black; discoidal cell exteriorly strongly contracted at base, thorax entirely black; valves of ovipositor or sheaths of latter brown; abdomen reddish; face, mandibles, and tegulæ pale yellow; wings hyaline, propodeum with a deep groove down middle; legs yellowish red; hind coxæ and their trochanters black; abdomen with a black line on second dorsal segment, its apical segment brownish black ....**exilis**

Length 8.5 mm. (female); antennæ piceous; most of fourth joint, extreme base of each succeeding joint, and apex, blackish; head yellow, smooth, a distinct black spot enclosing ocelli and extending over back of head; a spot in front and rear of mesothorax, a triangular spot on pleuræ, sternum, ultimate, penultimate, and antipenultimate abdominal segments above, black; abdomen beneath, fore and mid legs, and hind tarsi (in part), varying from yellow to pale reddish; fore and mid coxæ and trochanters white; hind legs rufous; trochanters and tips of tibiæ blackish; wings hyaline, veins blackish.....................**metallicus**

°E. **relictus** (Fabricius).

*E. **hyalinus** (Norton).

Type locality: Farmington.

°E. **lateralis** (Brullé).

°E. **curtus** (Norton). Howard, Insect Book, Pl. x, Fig. 28.

°E. **semirufus** (Norton).

E. **analis** (Say).

Colebrook, 21 July, 1905 (H. L. V.).

*E. **luteopectus** (Norton).

Farmington.

°E. **pseudargioli** (Howard).

Hosts: (*Thecla*) *Uranotes melinus*, (*Lycæna*) *Cyaniris pseudargiolus*.

E. **prismaticus** (Norton).

Has been taken in June and July.

E. (**Agrypon**) **rufulus** (Provancher).

Cheshire, 8 July, 1904 (H. L. V.).

°E. **exilis** (Provancher).

Host: American tent-caterpillar.

°E. **metallicus** (Norton).

E. (Sympratis) ferrugineus (Norton).

Length 11 mm., or less, to 15 mm.; face mostly brownish, eye margins yellow, front largely black, vertex and occiput mostly or entirely black; cheeks brown; mandibles mostly yellow, with a brownish tint and tipped with blackish, antennæ pale brown beneath; dark brown above; thorax mostly black, mottled with reddish, the latter color confined chiefly to the mesonotum, scutel, mesopleuræ, and metapleuræ; coxæ mostly black, tipped with brown; trochanters brown; fore femora yellowish in front, otherwise brown, the same as fore tibiæ and tarsi; mid femora, tibiæ and tarsi more or less brown, the mid tibiæ partly yellow; hind femora blackish beneath, brownish above, their tibiæ brown with the apical third blackish, basal joint of their tarsi mostly yellow, rest of tarsi mostly brown; wings yellowish brown, stigma and veins brown; abdomen mostly reddish, the black being confined to the second, fourth, and following segments on the summit of the abdomen and to the lower half of the sides of the third and following segments; exserted portion of ovipositor about as long as the first joint of the hind tarsi. The ferruginous area of the thorax may encroach on the propodeum.

New Haven, 3-10 May, 1904 and 1906, on flowers of honeysuckle (*Lonicera fragrantissima*), gooseberry (*Ribes oxyacanthoides*), currant (*R. rubrum*), willow, and Japan plum (*Prunus triflora*) (W. E. B. and H. L. V.).

Heteropelma Wesmael.

H. flavicorne Brullé. Howard, Insect Book, Pl. x, Fig. 18.

Length 26 mm.; black or brown, with fuscous or dark brown wings; antennæ mostly yellow or orange in color; fore femora and tibiæ mostly yellowish in front; rest of fore legs dark brown or blackish; exserted portion of ovipositor scarcely half the length of the first joint of the hind tarsi.

This species is a parasite on the larva of *Sphinx luscitiosa.*

Stafford, 24 August, 1905 (W. E. B.); Mt. Carmel, 27 August, 1904 (P. L. B.).

°**H. datanæ** Riley.

Female: length 25 mm.; reddish brown, abdomen varying to bronzy black; antennæ yellowish brown, a little darker than the head and thorax; scape yellowish beneath; face below antennæ and a narrow band around eyes (sometimes obsolete above) gamboge yellow; eyes dark brown or black in death; thorax darker above than below; mesonotum with three broad, darker, longitudinal bands which vary in intensity; propodeum varying in color; legs, especially tibiæ and tarsi, lighter in color than the thorax; fore trochanters sometimes quite yellow; wings dark fuliginous with bronze reflection; abdomen mostly concolorous with the thorax.

Parasitic on species of *Datana.*

Therion Curtis.

Exochilum Wesmael.

Key to Species.

1. Length 25 mm., or a little longer or shorter 2

Length much less than 25 mm. 4

2. Color differing from *Heteropelma flavicorne* practically only as follows: mid legs partly dark brown; hind legs with basal two-thirds of tibiæ yellow, apical third blackish; their tarsi with first and second joints almost entirely concolorous with the pale color of their tibiæ; remaining tarsal joints brown; legs may be more varied with yellowish brown and abdomen with brown; exserted portion of ovipositor not quite as long as thorax ....**morio**

Not as in *morio* 3

3. Black, with reddish marks; wings smoky yellow; antennæ mostly reddish; legs mostly yellowish; coxæ and apical half of hind femora and tibiæ black ....**fuscipenne**

Black; tarsi in part reddish; wings black, semiopaque, stigma dark; antennæ mostly yellow ....**tenuipes**

4. Length less than 19 mm. 5

Length 19 mm.; head mostly brownish red except face and cheeks, which are mostly yellowish; thorax, except blackish sutures, mostly brownish red; wings, antennæ, and legs much the same in color as in *fuscipenne*..**nigrovarium**

5. Length 14 mm.; otherwise agreeing with description of *nigrovarium* given above, except as follows: thorax mostly black, sides thereof partly reddish, greater part of hind femora, and apical third of their tibiæ black or blackish; exserted portion of ovipositor nearly as long as first joint of hind tarsi ....**sassacus**

Length 13 mm. (male); otherwise much as in above description of *sassacus*, from which it differs as follows: reddish, with the following parts more or less black: front, vertex, sutures of thorax, hind coxæ, lower half and extreme upper edge of abdomen; face mostly yellowish brown, fore and mid coxæ stramineous .... **waccagum**

T. morio (Fabricius). *Exochilum mundum* (Say). Howard, Insect Book, Pl. x, Figs. 13, 14.

Hosts: (*Pyrameis*) *Vanessa cardui*, (*Papilio*) *Iphidicles ajax*, *Zerene centenaria.*

New Haven, 20 July, 1904 (B. H. W.); Branford, 28 June, 1, 5, and 7 July, 1905 (H. W. W.).

°**T. fuscipenne** Norton.

***T. tenuipes** Norton.

°**T. nigrovarium** Brullé.

***T. sassacus** Viereck (new species).

Type locality: Windsor, 26 July, 1905 (W. E. B.).

***T. waccagum** Viereck (new species).

Type locality: North Haven, 3 August, 1905 (B. H. W.).

Thyreodon Brullé.

T. brullei (new name). *T. morio* Authors, not Fabricius. Howard, Insect Book, Pl. x, Fig. 15.

In size and color almost exactly like *Heteropelma flavicorne;* face mostly yellow in the male. Parasitic on *Sphinx coniferarum.*

New Haven, 20 July, 1903 (B. H. W.); North Haven, 3 August, 1905 (H. L. V.).

Ophion Fabricius.

Key to Species.

1. Cubitodiscoidal cell uniformly membranous 2
   Cubitodiscoidal cell with thickenings in form of glabrous spots or areas on its membrane 6
2. Wings hyaline 3
   Wings deep brown; body brownish stramineous, except abdomen, which is mostly brownish .... **slossoni**
3. Length 16 mm. 4
   Length 25 mm.; stramineous to brownish stramineous ..**macrurus**
4. Body stramineous to pale brownish stramineous; wings colorless or nearly so 5
   Body reddish or dark brownish stramineous; wings yellowish, tinted with brown ....**bifoveolatus**
5. Propodeum with one large enclosed area on its posterior aspect, or with more than one, but differing from *tityri* **bilineatus**
   Propodeum with a number of quadrangular areas on poste-

rior aspect, formed by seven lines radiating from insertion of abdomen and by two transverse ridges. Length 17.5 mm. (male) ....**tityri**

6. Length 16-23 mm.; stramineous to brownish stramineous; head more or less yellowish; ocelli equidistant, mandibles fuscous apically; scutel stramineous; wings transparent with a fuscous tinge; legs honey-yellow ....**purgatus**

Length 23 mm.; light reddish, head yellowish; ocelli equidistant; mandibles fuscous apically; scutel yellow; wings hyaline, without a fuscous tinge, legs honey-yellow ..**arcuatus**

O. (**Enicospilus**) **arcuatus** Felt.

South Britain, 1884 (G. F. Pierce).

O. (E.) **purgatus** Say. Howard, Insect Book, Pl. x, Fig. 19.

A parasite of the army worm (*Leucania, Heliophila*) *Cirphis unipuncta.*

North Haven, 27 May, 1904 (W. E. B.); New Haven, 6 July, 1904 (H. L. V.); Branford, 5 July, 1904 (P. L. B.); Stonington, 7 August, 1906 (W. E. B.).

°O. (**Ophion**) **tityri** Packard.

Parasitic on (*Eudamus*) *Epargyreus tityrus.*

O. (O.) **bifoveolatus** Brullé.

O. (O.) **bilineatus** Say. Howard, Insect Book, Pl. x, Fig. 17; Scudder, Butterflies of New England, Vol. III, Pl. 88, Fig. 8.

Parasitic on (*Eudamus*) *Epargyreus tityrus.*

Mt. Carmel, 25 May, 1906, Poquonock, 22 March, 1905, New Haven, 26 April, 1905 (B. H. W.); New Haven, 23 August 1904, Woodmont, 24 May, 1905 (P. L. B.); New Haven, 1 September, 1904 (H. L. V.); New Haven, 24 May, 1905, Salisbury, 27 August, 1904 (W. E. B.); Branford, 5 July, 1905 (H. W. W.).

*O. (O.) **slossoni** Davis.

Reared from (*Acronycta*) *Apatela.*

O. (**Allocamptus**) **macrurus** Linnæus. Howard, Insect Book, Pl. ix, Figs. 7, 8. Parasite of the Cecropia moth, *Samia cecropia.*

New Haven (A. E. V., W. E. B.).

Zemiodes Foerster.

°Z. **flavifrons** Cresson.

Male: length 7 mm.; mostly black, with abdomen and hind legs reddish; propodeum with longitudinal carinæ; nervulus and basal veins interstitial.

Symphobus Foerster.

°**S. pleuralis** Cresson.

Female: body 5 mm. long; ovipositor with its exserted portion 5 mm. long.; body mostly black, with pleuræ, sternum, scutel and lateral portions of second and third abdominal segments reddish; legs honey-yellow; hind tarsi and apex of femora and tibiæ also dusky; abdominal segments beyond the second distinctly margined with white; areólet petiolate.

Oxytorus Foerster.

°**O. antennatus** Cresson.

Female: length of body 7 mm.; reddish to blackish red, with the head opaque, blackish, antennæ with a white annulus, rest of antennæ blackish except the scape, which, like the mouth-parts, is reddish; hind tarsi annulated with white; wings hyaline, veins and stigma pale.

Rogas Nees.

Alexeter (Foerster) Wolstedt.

Key to Species.

Antennæ with a white annulus; hind femora and coxæ reddish; notauli wanting .... **honestus**

Antennæ without a pale annulus; scutel reddish; notauli present; thorax and abdomen pale, unicolorous; head concolorous with thorax, face more or less yellow ... **canaliculatus**

***R. honestus** Cresson.

Female and male: length 6-8 mm.; mostly reddish.

°**R. canaliculatus** Provancher.

Female and male: length 8-11 mm.; mostly pale honey-yellow to reddish, with the face, mouth-parts, tegulæ, fore and mid legs yellowish or pale.

Hadrodactylus Foerster.

Key to Species.

Thorax black; second abdominal segment scarcely longer than broad; hind legs reddish; abdomen sometimes dusky at apex, the latter mostly reddish; trochanters usually, and fore and mid cóxæ, yellow .... **inceptus**

Thorax reddish; head black; face and hind tarsi yellow .... **longicornis**

H. inceptus Cresson.

Female and male: length 8-12 mm.

°**H. longicornis** Cresson.

Female and male: length 10 mm.; abdomen dark reddish; areolet sometimes incomplete or wanting; trochanters and fore and mid coxæ yellow.

Mesoleptidea Viereck.

Mesoleptus Authors, not Gravenhorst.

Key to Species.

1. Clypeus transversely impressed before apex, usually ridged transversely back of the impression and more or less emarginate at the front edge; hind femora pale......... 2
   Clypeus elevated, without a distinct margin at apex or transverse impression before apex; hind femora rufous; petiole of abdomen and coxæ rufous; scutel and often part of thorax rufous ....**rufigastra**
2. Antennæ without a white annulus; abdominal segments black, with apical margins more or less white............... 3
   Antennæ reddish ....**albifrons**
3. Sternum and scutel white ....**decens**
   Sternum of female honey-yellow, scutel of male with two white stripes ....**zebrata**

°**M. rufigastra** Provancher.

Female: length 5 mm.; head and thorax mostly black; abdomen mostly reddish.

°**M. zebrata** Davis.

Female and male: length 5 mm.; mostly black, ornamented with pure ivory-white; whitish ornaments in the male not so pure white except on the abdomen.

***M. albifrons** Cresson.

Female: length 9 mm.; mostly reddish, with the head, pronotum, mesonotum, abdomen beyond petiole, and apical portion of hind tibiæ, dusky red to black.

***M. decens** Cresson.

Female and male: length 7-10 mm; mostly black, ornamented with white.

Gausocentrus Foerster.

°**G. gyrini** Ashmead.

Male: length 3.5-3.8 mm.; black, shining, impunctate or apparently so, clothed with sparse grayish hairs that are more in evidence on the face and metapleura than elsewhere; apex of second dorsal abdominal segment broadly margined with red; petiole of abdomen and second dorsal segment toward base subopaque, the former channeled, the latter feebly pitted basally; petiole of abdomen nearly as wide at base as at apex, and about one-fourth longer than the second abdominal segment, third segment about two-thirds as long as the second, the fourth about one-half as long as the third, succeeding segments shorter, subequal.

Bred from a water beetle of the genus *Gyrinus*.

Catoglyptus Foerster.

***C. ? fucatus** Cresson.

Female: length 6-8 mm.; color varies from almost uniformly brownish red, to brownish red with the thorax, except mesonotum and scutel, and the upper part of the head, black; abdomen often dusky or blackish at apex; legs varied with pale yellow, dusky, and blackish; antennæ varying shades of brown, reddish toward apex; ovipositor exserted; areolet wanting.

Type locality: Connecticut.

Notopygus Holmgren.

°**N. cultus** Cresson.

Female: length 9 mm.; almost uniformly reddish, with face and mouth-parts yellowish; spot enclosing ocelli, another around base of antennæ, and dorsum of third and fourth abdominal segments, dusky.

Homaspis Foerster.

°**H. albipes** Davis.

Female: length 10 mm.; mostly black, with the abdomen almost entirely reddish; thorax and head ornamented with white; upper portion of fore and mid coxæ, their tibiæ and their tarsi, except apical segments, white; rest of legs mostly reddish; ovipositor scarcely exserted.

Polycinetis Foerster.

°**P. limatus** Cresson.

Female and male: length 9 mm.; mostly black; mouth-parts, tegulæ, a point in front of the latter, a line beneath face, and scape beneath in the male, yellow; legs reddish, except the hind tarsi and apex of their femora and tibiæ, which are dusky, the latter in addition with more or less white on the basal half, especially in the female; areolet petiolate, oblique.

Spanotecnus Foerster.

Key to Species.

1. Head, thorax, and usually base of abdomen, coarsely punctate 2
   Head, thorax, and abdomen distinctly shagreened; body uniformly whitish yellow, or with dusky patches. Length 5 mm. (male and female) ....**discolor**
2. Thorax and most of rest of body dusky; scutel and face mostly yellow ....**obscurellus**
   Body, including thorax, almost or entirely uniformly reddish brown or brownish stramineous ....**concolor**

***S. obscurellus** Davis.

Female: length 6 mm.; propodeum and legs reddish.

S. concolor Cresson.

Female and male: length 7-9 mm.

New Haven, 26 May, 1904 (H. L. V.); 17, 24 May, 1905 (W. E. B., B. H. W.); Mt. Carmel, 24 May, 1906 (B. H. W.).

°**S. discolor** Cresson.

Mesoleius Holmgren.

Key to Species.

1. Abdomen black or blackish; scutel and apical margin of dorsal abdominal segments more or less white; pleura reddish or white 2
   Most of thorax and abdomen reddish, scutel yellow.....**scapularis**
2. Hind tibiæ white at base or with a distinct white annulus; mesonotum black; hind coxæ and femora reddish .... **submarginatus**
   Hind tibiæ without a distinct annulus; face mostly black; scutel with lateral white stripes ....**mellipes**

***M. scapularis** Cresson.

Female and male: length 8 mm.; head black; legs reddish, except trochanters and fore and mid coxæ, which are yellow; areolet usually absent.

M. submarginatus Cresson.

Female and male: length 5-8 mm.; head black.

°**M. mellipes** Provancher.

Female and male: length 6-7 mm.; legs mostly dark to pale reddish.

Holmgrenia Foerster.

***H. tarsalis** Cresson.

Female: length 8 mm.; mostly black; dorsal abdominal segments with distinct, white, apical margins; pleuræ and sternum reddish; hind distal trochanters and a narrow annulus near the base of hind tibiæ, white; hind coxæ rufous; hind femora black.

Type locality: Branford, 3 September, 1904 (H. L. V.).

Sphecophaga Westwood.

Cacotropa (Foerster) Thomson.

°**S. burra** Cresson.

Female: length 7 mm.; mostly reddish; head, prothorax, sternum, dorsum of thorax around bases of wings, and scutel, mostly black or blackish; anterior orbits, pronotum, tegulæ, margin of prothorax and anterior margin of mesopleuræ, white; areolet absent; ovipositor scarcely exserted. Male: differs in having the thorax almost entirely blackish; face, lower half of cheeks, scape beneath, pedicel, sternum, fore and mid coxæ and trochanters, scutel, and the other parts noted in the description of white portions in the female, white.

Dialges Foerster.

Key to Species.

Hind coxæ black; scutel almost always black; hind tibiæ and tarsi black or blackish, with a yellow annulus; areolet oblique; length 7 mm. (female and male); mostly black **frontalis**

Hind coxæ rufous; tibiæ black with a yellow annulus; scutel yellow; otherwise as in *frontalis*..........**frontalis** var. **rivalis**

°**D. frontalis** Davis.

°**D. frontalis** var. **rivalis** Davis.

Tryphon Gravenhorst.

No distinct transverse impressions before the apex on the first and second dorsal abdominal segments.

Key to Species.

1. Scutel quadrangular, flat above and distinctly margined and beveled laterally .... **seminiger**
Scutel triangular, not flat above, but subpyramidal 2
2. Abdomen partly rufous; coxæ and femora, except apex of latter, reddish .... **communis**
Abdomen black or blackish............. **communis** var. **clypeatus**

T. seminiger Cresson.

Female and male: length 6-8 mm.; head and thorax mostly black; fore and mid legs mostly brownish stramineous, hind legs mostly dusky or dark brown; most of first, sixth, and seventh (fifth sometimes) dorsal abdominal segments black; areolet present, oval petiolate; ovipositor slightly exserted.

T. communis Cresson.

Female and male: length 6-9 mm.; head and thorax mostly black; first dorsal abdominal segment with the basal half partly black; legs mostly reddish; areolet present, quadrangular, its sides subequal, nearly sessile; ovipositor distinctly exserted.

°**T. communis** var. **clypeatus** Provancher.

Male: differs from the typical form in having the abdomen black or blackish.

Quadrigana Davis.

°**Q. americana** Cresson.

Female and male: length 9-11 mm.; black, with the abdomen, except basal portion of petiole, reddish in the male; the face, scape beneath, mouth-parts, tegulæ, fore and mid legs, trochanters, tarsi, and an annulus on the tibiæ of the hind legs pale yellow; in the female these parts are more nearly reddish, while the face above the clypeus is mostly black.

Cosmoconus Foerster.

°**C. canadensis** Provancher.

Female and male: length 6-9 mm.; black; face, mouthparts, more or less of antennæ at base, fore and mid legs, except more or less of the femora and coxæ, hind legs (except coxæ, femora and apex of tibiæ), tegulæ, and more or less of abdomen from apex of first to apex of fifth dorsal segment, pale lemon-yellow; the third segment always yellow; antennæ brown, reddish at apex.

Syncecetes Foerster.

Key to Species.

Face mostly black, clypeus yellow; thorax black; abdomen and legs rufous; fore and mid legs paler; in male, trochanters and coxæ whitish; mouth parts and tegulæ pale yellow, antennæ reddish; petiole of abdomen often dusky; wings hyaline, veins and stigma brown. Length 6-7 mm. (female and male) .... sedulus

Face yellow; rest of head mostly black; antennæ, legs, and more or less of median dorsal abdominal segments, reddish; mouth-parts, scape beneath, tegulæ, trochanters, fore and mid coxæ, whitish yellow; wings hyaline, veins and stigma yellow. Length 7 mm. (male)............ propinquus

S. sedulus Cresson.

°**S. propinquus** Cresson.

Provancherella Dalla Torre.

Baryceros Provancher.

°**P. rhopalocera** (Provancher).

Male: length 8 mm.; head and thorax black; abdomen and legs reddish; face, scape beneath, mouth-parts, cheeks at base of mandibles, tegulæ, trochanters, and fore and mid coxæ, yellowish white; antennæ pale reddish, with the apical fourth dark brown; basal segment of abdomen and apex of hind femora and tibiæ, more or less black; the apex of the abdomen may be dusky; areolet oblique, petiolate.

Otlophorus Foerster.

°**O. innumerabilis** Davis.

Female and male: length 4-8 mm.; mostly black; abdomen reddish, with its petiole black, and in some cases with the second and apical segments dusky in the male; legs reddish; coxæ, and in some specimens the trochanters, tibiæ, and tarsi of hind legs in the male, dusky; tibiæ at apex and hind tarsi in the female slightly dusky; apical half of clypeus, mouth-parts, and tegulæ, reddish; antennæ black in the male, reddish brown in the female; areolet oblique, petiolate.

°**O. innumerabilis** var. **feria** Davis.

Differs from the typical form in the coxæ being pale reddish or yellow in the male, and in the abdomen being devoid of black except on the basal segment.

Rhimphalea Foerster.

***R. erythrogastra** Viereck (new species).

Female: length 8.5 mm.; most of front, vertex, occiput, and cheeks black; rest of head mostly yellow; scape mostly brown; pedicel mostly black or blackish; flagel with its basal half pale brown beneath, dark brown or blackish above, its apical half mostly pale brown throughout; thorax mostly black; tegulæ, anterior margin of propleuræ, three marks on mesopleuræ, scutel mostly and postscutel mostly, yellow; middle third of propodeum mostly reddish; wings with a quadrangular petiolate areolet; fore and mid coxæ and trochanters mostly or entirely yellow; most of the remaining portions of the fore and mid legs brownish stramineous; hind coxæ and trochanters mostly yellow; the femora partly reddish or concolorous with the hind femora, which latter are tipped with dusky and yellow; hind tibiæ yellowish at base, with a sub-basal blackish annulus, the remaining portion brown, tipped with dusky, their tarsi mostly blackish; abdomen mostly reddish, the basal segment black basally, the third and following dorsal segments with an apical yellowish margin, the fourth and following dorsal segments more or less dusky.

Type locality: Branford, 1 July, 1905 (H. W. W.).

Otoblastus Foerster.

O. compressiventris (Cresson).

Female: length 5 mm.; head and thorax black, with a median spot on the face; clypeus, mouth-parts, tegulæ, tubercles, a spot or two on the mesopleuræ, a triangular spot on the margins of the mesonotum, fore and mid coxæ and trochanters, all lemon-yellow; rest of legs stramineous; abdomen reddish; ultimate, penultimate, and sometimes the antepenultimate dorsal abdominal segments blackish or black, as is most of the basal dorsal segment; antennæ brownish red; ovipositor exserted; abdomen strongly compressed toward apex. Male: differs in the following particulars: face entirely, antennæ beneath, spot on cheeks beneath, and stripe on anterior half of mesopleuræ, yellow; abdomen blackish, reddish on the second and third dorsal segments; hind coxæ black, yellow at apex.

Polyblastus Hartig.

Males and females: length 5-7 mm.; mostly black.

Key to Species.

Clypeus except at extreme base, mouth-parts, tegulæ, a broad annulus on basal middle of hind tibiæ, tibial spurs and more or less of basal portion of tarsal segments, white; remainder of hind tibiæ and tarsi black; rest of legs reddish; antennæ dark brown, paler at base than elsewhere **pedalis**

Clypeus, mouth-parts, tegulæ, fore and mid coxæ, and all trochanters, lemon-yellow; upper middle annulus on hind tibiæ and basal portion of tarsi white; rest of tibiæ and tarsi black or blackish; remainder of legs reddish; antennæ brown, paler beneath than above, yellowish in male; first dorsal segment typically blackish, with its apical half pale rufous, second, third, and sometimes adjoining dorsal segments reddish .... **tibialis**

P. pedalis (Cresson).

Thompson, 11 July, 1905 (H. L. V.).

°**P. tibialis** (Cresson).

Scolobates Gravenhorst.

°**S. crassitarsus** Gravenhorst.

Female: length 8 mm.; head black except face, mouth-parts, and cheeks, which are reddish: thorax black; abdomen black, except beneath, and second and third dorsal segments, all of which are reddish; coxæ, trochanters, base of femora, hind tarsi and their tibiæ, except at base, black; rest of legs reddish; antennæ reddish brown.

Monoblastus Hartig.

M. varifrons (Cresson).

Female and male: length 5-7 mm.; head and thorax mostly black; abdomen usually reddish, with the basal and apical segments black or piceous, or the abdomen all or nearly all blackish; color of legs varying from entirely or almost entirely pale reddish, to dark reddish, with the fore and mid coxæ and trochanters yellowish white, and more or less of the hind coxæ black, and sometimes the trochanters and apex of tibiæ and tarsi of hind legs dusky; most of face, including the clypeus, and the mouth-parts, tegulæ, tubercles, and usually more or less of the scutel, yellow, or the face only partly yellow; antennæ brown.

Erromenus Holmgren.

Females and males: length 6-7 mm.; mostly black.

Key to Species.

Apical portion of clypeus, mouth-parts, and antennæ in female dusky reddish; legs reddish; in male legs may be blackish or black; antennæ brownish black in male ....**crassus**

Apical portion of clypeus dusky reddish to yellowish; tegulæ blackish to yellowish, antennæ black; legs reddish; coxæ and usually trochanters black; hind tibiæ with a more or less distinct yellow annulus at base; second, third, and fourth dorsal abdominal segments reddish; third and fourth sometimes blackish or black........................**dimidiatus**

E. dimidiatus Cresson.

Mt. Carmel, 24 May, 1906 (B. H. W.); New Haven, 24 May, 1905 (W. E. B.).

°**E. crassus** Cresson.

Scopiorus Foerster.

Females and males: length 6-7 mm.; mostly black.

Key to Species.

Face, mouth-parts, scape beneath, tegulæ, trochanters, and abdomen beneath, yellow; female in addition with lower half of cheeks, sternum, lower margin of pleuræ, fore and mid coxæ, and apical margin of last two or three dorsal abdominal segments, yellow; male with more or less of a vertical line on face and the clypeal suture yellow; antennæ reddish brown in male, in female more yellowish; areolet usually present; legs and first three or four basal dorsal segments of abdomen reddish ....**analis**

Clypeus, mandibles, palpi, tegulæ, and scape beneath, yellowish white; legs reddish, often with apex of femora and tibiæ and tarsi of hind legs dusky; antennæ varying from pale reddish brown to nearly black; areolet usually present; abdomen varying from reddish with ultimate and penultimate dorsal segments black, to black with second dorsal segment either reddish or blackish.............**subcrassus**

S. subcrassus (Cresson).

°**S. analis** (Cresson).

Euceros Gravenhorst.

Eumesius Westwood.

Key to Species.

1. Hind tibiæ reddish, sometimes yellow at base; hind tarsi unicolorus; wings faintly dusky at tips 2
Hind tibiæ black or dusky, yellow at base; coxæ black to yellow; abdomen varied with black and yellow, and always with a more or less distinct median longitudinal yellow stripe; stigma reddish; hind coxæ and scutel at base mostly black. Length of body 11 mm. (female and male)...**canadensis**
2. Sternum reddish and concolorous with rest of thorax........ 3
Sternum lemon-yellow; thorax above black and yellow; mostly yellow. Length 9 mm. (male)..............**thoracicus**
3. Abdomen fulvous, with more or less distinct transverse yellow spots; thoracic vittæ yellow; mostly rufo-ferruginous with yellow markings. Length 9-10 mm. (female) ..**medialis**
Abdomen and thorax uniformly pale fulvous; mostly pale dull yellow or yellowish red without distinct yellow markings (female and male) ....**flavescens**

***E. thoracicus** Cresson.

Type locality: Connecticut.

***E. flavescens** Cresson.

°**E. medialis** Cresson.

°**E. canadensis** Cresson.

Eczetesis Foerster.

°**E. paniscoides** Ashmead.

Female: length 8-10 mm.; mostly honey-yellow, with the abdomen darker toward the apex; face, prothorax, and tarsi paler; areolet triangular, subpetiolate; ovipositor exserted.

Sympherta Foerster.

Key to Species.

Female and male: length 8 mm.; head and thorax mostly black; abdomen mostly reddish; nervellus branched below middle ....**burra**
Female: length 7 mm.; body almost entirely pale brownish yellow; nervellus branched above middle ....**unicolor**

***S. burra** (Cresson).

°**S.** (subgenus?) **unicolor** (Cresson).

Ctenopelma Holmgren.

°**C. sanguineum** Provancher.

Female and male: length 8-10 mm.; mostly reddish; female with the scutel, tegulæ, and a line on the mesopleuræ, and male with the scutel, tegulæ, tubercles, a line on the mesopleuræ, the sternum, face, orbital lines, and mouth-parts, yellow; fore and mid legs and prothorax yellowish; areolet petiolate; ovipositor slightly exserted.

Rhorus Foerster.

R. bicolor (Cresson).

Female and male: length 7-8 mm.; head and thorax mostly black, abdomen mostly reddish, in the male blackish at base and apex, in the female dusky at base; fore and mid legs in the female mostly brownish stramineous or plain stramineous, in the male with the fore and mid coxæ and trochanters as well as the trochanters of the hind legs, whitish; hind legs in both sexes mostly reddish; areolet hardly petiolate, practically sessile; exserted portion of ovipositor a little longer than the second joint of the hind tarsi.

West Haven, 27 June, 1905 (H. L. V.).

Exyston Schiödte.

Abdomen more or less reddish.

Key to Species.

1. Thorax black, with light markings 2
   Thorax and head honey-yellow to reddish; petiole of abdomen carinate; wings hyaline. Length 7-8 mm. (female and male) .... **variatus**
2. Scutel entirely yellow; hind coxæ reddish; abdomen black at base 3
   Scutel yellow only at tip; abdomen blackish at apex; hind coxæ black or blackish, hind femora and tibiæ reddish, narrowly black at base and apex; abdomen mostly reddish, black on first and at base of second, also at base of dorsal segments on apical portion of abdomen; apical margin of third and following segments usually yellow; face entirely yellow. Length 2.9 mm. (male) ....**clavatus**
3. Head black, or black and yellow, behind eyes; thorax usually black. Length 6-9 mm. (female and male).......**abdominalis**
   Head reddish behind eyes; thorax more or less reddish; as long as the typical form (female and male) ....
   abdominalis var. **rufinus**

E. clavatus Cresson.

°**E. variatus** Provancher.

°**E. abdominalis** Cresson.

°**E. abdominalis** var. **rufinus** Davis.

Anecphysis Foerster.

°**A. curvineura** Davis.

Female and male: length 7 mm.; mostly black; face, orbital lines at sides of antennæ, mouth-parts, tegulæ, a line on the mesopleuræ, scutel, coxæ of fore and mid legs, all trochanters, apex of hind femora, base of hind tibiæ, annulus in the middle of the hind tibiæ, a spot at the tip of the abdominal petiole in the middle, a spot on each side at base of the second dorsal, and apical fifth of the second and following dorsal abdominal segments, lemon-yellow; hind coxæ black, rest of hind legs except yellow portions, and all femora, reddish black; fore and mid tibiæ and tarsi brownish yellow.

A. ruficrus (Walsh).

Female: length 5 mm.; head mostly black, with the subantennal protuberance, the pedicel in front and most of the mandibles, yellow; palpi stramineous; scape in front yellowish brown; flagel pale brown beneath, dark brown above; thorax mostly black; tubercles, tegulæ, a mark at the lateral edge of the mesonotum anteriorly, fore and mid coxæ and trochanters, yellow; hind trochanters also yellow; rest of legs reddish or nearly so; abdomen mostly reddish, first dorsal segment, summit of fourth dorsal, summit and part of sides of fifth dorsal, and nearly all of the following segments, black; exserted portion of ovipositor as long as or a little longer than the first joint of the hind tarsi.

West Haven, 27 June, 1905 (H. L. V.).

Exenterus Hartig.

Cteniscus Curtis.

Key to Species.

1. Thorax black or with yellow markings; scutel more or less yellow; face yellow; abdomen mostly reddish............ 2
   Thorax, abdomen, and legs pale reddish ....**orbitalis**
2. Hind coxæ reddish or piceous ....**consors**
   Hind coxæ lemon-yellow ....**flavicoxæ**

°**E. orbitalis** Cresson.

Female: length 6 mm.

°**E. flaxicoxæ** Cresson.

Female and male: length 5 mm.

***E. consors** Cresson.

Female: length 6 mm.

Type locality: Connecticut (E. N.).

Syrphoctonus Foerster.

***S. agilis** (Cresson). *Bassus agilis* Cresson.

Male: length 4 mm.; mostly black; face beneath antennæ, lower part of cheeks, scape beneath, a large mark on each side of the mesothorax, tegulæ, a spot before on the scutels, pleuræ, except a large mark beneath the wings, base of fore and mid legs, and a basal spot on each side of the third dorsal abdominal segment, yellow; antennæ stramineous beneath; wings hyaline, veins and stigma brown, areolet wanting; legs pale honey-yellow, hind tibiæ and tarsi blackish, bases of former more or less, and their spurs, pale; venter of abdomen more or less pale.

Type locality: New Haven, 15 July, 1904 (W. E. B.).

Promethes Foerster.

°**P. costalis** (Provancher). *Bassus costalis* Provancher.

Female: length 5 mm.; mostly black; mouth, palpi, tegulæ, a mark in front of tegulæ, a line on mesopleuræ, costa, the coxæ, and trochanters, pale yellow; hind coxæ more or less reddish beneath.

Diplazon (Nees) Gravenhorst.

Bassus Authors, not Fabricius.

***D. frontalis** (Cresson).

Female: length 5 mm.; mostly black; spot on face, sometimes the margins of the clypeus, a spot on the mandibles, palpi, tegulæ, a spot or cuneiform mark in front of the tegulæ, a short line beneath the tegulæ on the mesopleuræ, and a spot at tip of the scutel, white; legs honey-yellow, tips of hind femora, their tibiæ, except bases, which are pale, and their tarsi, black; wings hyaline; veins brown, areolet wanting.

***D. concinnus** (Cresson).

Female: length 5.5 mm.; mostly black; anterior orbits, clypeus, mandibles mostly, palpi, tegulæ, a spot in front of tegulæ, two spots beneath tegulæ, scutel, and postscutel, lemon-yellow; clypeus bilobed at tip; wings hyaline, veins and stigma brown, areolet wanting; legs mostly pale honey-yellow, fore coxæ, all trochanters, and tips of femora, yellow; hind tibiæ white, the tips of the latter and their tarsi entirely black.

Type locality: Connecticut (E. N.).

D. lætatorius (Fabricius).

Female: length 5 mm.; mostly black; antennæ dark brown above, pale brown beneath, inner orbits with a luteous margin; clypeus, most of mandibles, and a small spot on the malar space, luteous; palpi, a marginal mark on each side of mesonotum, tegulæ, a mark in front of and below the latter, base of wings, a quadrate mark on scutel, and a transverse line on the postscutel, luteous; abdomen beneath mostly brownish stramineous to brown, dorsum of abdomen with the basal joint, except the apical margin, which is reddish, and the second and third segments, which are reddish, mostly black; legs stramineous to brownish stramineous, except the hind tibiæ, which are ornamented by four different annuli, as follows: basal annulus brown, about .5 mm. long, followed by a yellowish white annulus of about the same length, and the latter followed by a brown annulus less than .2 mm. long; apical .5 mm. of this joint with a stramineous annulus; tarsi of hind legs brown.

This species is cosmopolitan. It has been taken in New Haven, 15 July, 1904 (W. E. B.); West Haven, 27 June, 1905 (H. L. V.) and occurs, no doubt, throughout the state.

***D. sycophanta** (Walsh).

Female and male: length 4-6 mm.; mostly black; anterior orbits in the female, entire face in the male, clypeus, mandibles, palpi, a spot on each side of the propodeum, the tegulæ, two spots beneath the latter, a spot beneath the hind wings, the scutel, and more or less of the fore and mid coxæ and trochanters, white or yellowish white; hind tibiæ and their tarsi black, except a broad white annulus; in some cases the hind tibiæ tricolored with black, white, and reddish, or reddish and white; wings hyaline, veins and stigma blackish, pale at base, areolet wanting; legs and abdomen reddish, the basal segment of the latter often more or less black, as are several segments of the apical half of the abdomen; in some specimens the abdomen black, with a broad medial reddish band.

New Haven, 24 June, 1902 (E. J. S. M.).

°**D. orbitalis** (Cresson).

Male: length a little less than 4 mm.; color as in *Syrphoctonus agilis*, except as follows: no spot before the tip of the scutel; the greater part of the superior, anterior, and inferior borders of the mesopleuræ, a long mark on the scutel, a transverse mark on the postscutel, and more or less of the apical margins of the second and third dorsal abdominal segments, yellow or yellowish; rest of pleuræ black; legs stramineous or yellowish except the extreme tip of the hind femora and a basal and an apical annulus on their tibiæ, which are brown like their tarsi; hind tibiæ yellowish white between the dark annuli; malar space yellow; face of female with the inner orbits margined with yellow, greater part of face below the antennæ black; mesopleuræ with less yellow, antennæ black; legs somewhat stramineous, with a part thereof rather bright brownish red; abdomen almost entirely black, otherwise as in the male.

D. (Homotropus) bicapillaris (Walsh).

Female: length 5 mm.; black, except as follows: clypeus mostly pale, mandibles mostly yellow, palpi rather stramineous; pronotum in front with a lateral marginal stripe or mark; tegulæ, tubercles, a line beneath the tegulæ, a line between the meso- and metapleuræ, posterior edge of scutel, and a sub-basal annulus on the hind tibiæ, more or less yellow; fore and mid legs, as well as the hind coxæ, trochanters, and femora, reddish; hind tibiæ, except for the annulus, brownish and blackish, the basal sixth of the annulus being the former color and its apical third the latter; hind tarsi black; wings with an areolet that is subpetiolate.

West Haven, 27 June, 1905 (H. L. V.).

D. (Zootrephes) antennatus (Davis).

Female: length 4.5 mm.; head and thorax mostly black; abdomen mostly reddish, black at base and apex; face beneath antennæ and for a short distance above along the eye margins, scape in front, mandibles mostly, palpi, tubercles, tegulæ, a line beneath the latter, mesosternum on each side, fore and mid coxæ and trochanters, hind coxæ beneath, and their trochanters, yellow; pedicel yellowish brown; flagel pale brown; portions of legs not described as to color, brownish stramineous; wings without an areolet.

Woodmont, 9 July, 1904 (P. L. B.).

Orthocentrus Gravenhorst.

°**O. nigricoxus** Provancher.

Female and male: length 3 mm.; mostly black; legs pale, hind femora and coxæ blackish to black; face and scape beneath dark reddish in the female, lemon-yellow in the male; abdomen black to piceous; basal dorsal segment and extreme base of second dorsal segment of the abdomen finely pitted, the remainder of the dorsum of the abdomen polished; wings hyaline and with an areolet.

Brephoctonus (Foerster) Ashmead.

***B. hygrotrecha** Viereck (new species).

Female: length 3 mm.; mostly black above, except apical half of abdomen, which is brownish; face, mouth-parts and antennæ brown, palpi yellowish; venter of abdomen mostly yellowish; legs almost entirely stramineous; areolet absent; ovipositor scarcely exserted; tegulæ yellowish. Male: differs from female in the scape being yellowish in front, and in the face, which is lemon-yellow.

Type locality: New Haven, where the species was taken 1 June, 1904 (H. L. V.), running on water.

Hyperacmus Holmgren.

***H. ovatus** Davis.

Female: length 4 mm.; mostly black, with legs honey-yellow; the hind coxæ, however, may be blackish; antennæ dusky red, paler at base than elsewhere, a protuberance beneath the antennæ blackish red, palpi yellowish white; abdomen subclavate; its ovipositor slightly exserted.

Bred from the clothes-moth of the genus *Tinea* on two different occasions, once by Dr. C. V. Riley, and again by one J. H. E., who reared the species in May, 1885.

Exochus Gravenhorst.

Key to Species.

1. Hind tibiæ without a pale annulus, but with at least the basal two-thirds whitish 2
Hind tibiæ black at base and apex, with a white annulus between; abdomen black, or dusky reddish at base......... 5
2. Hind tibiæ reddish to pale honey-yellow, or with at least the basal two-thirds whitish, but always with apex of same dusky to black; thorax with a white stripe or triangular spot in front of tegulæ, scutel more or less pale, mesonotum black; abdomen punctate above; first and second pleural areas of propodeum separated by a ridge.......... 3
Hind tibiæ unicolorous 4
3. Abdomen black, or at least with only one or two segments narrowly pale at their apex. Length 5-7 mm. (female and male) ....**pallipes**
Abdomen with lateral apical corners of second and third dorsal segments yellow. Length 5 mm. (male).......... **pallipes** var. **pleuralis**
4. Abdomen black, or with apical margins of dorsal segments narrowly pale; second dorsal abdominal segment polished or finely punctate; legs entirely reddish, without a pale line in front of tegulæ. Length 3.5-5 mm. (female and male) ....**propinquus**
Abdomen mostly reddish, black at base, or black at base and apex. Length 7-8 mm. (female and male)..........**semirufus**
5. Mesopleuræ, and usually most of the thorax, reddish. Length 5.7 mm. (female and male) ....**dorsalis**
Mesopleuræ and rest of mesothorax not reddish; abdomen black throughout; size the same as in the typical form **dorsalis** var. **annulicrus**

***E. propinquus** Cresson.

E. semirufus Cresson.

New Haven, 15 May, 1905 (B. H. W.), 24 May, 1905 (W. E. B.); Mt. Carmel, 25 May, 1906, Southington, 16 May, 1906 (B. H. W.).

E. pallipes Cresson.

New Haven, 22 May, 1905 (B. H. W.); Branford, 28 July, 1905 (H. L. V.).

°**E. pallipes** var. **pleuralis** Cresson.

°**E. dorsalis** Cresson.

°**E. dorsalis** var. **annulicrus** Walsh.

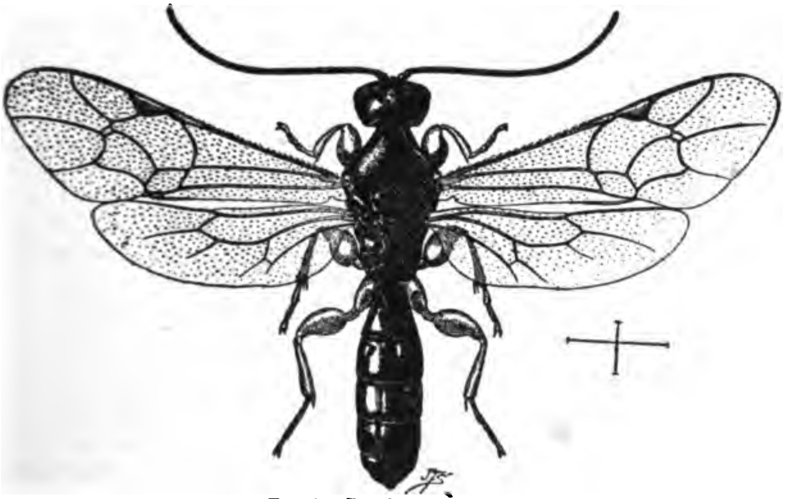

FIG. 9.—*Exochus propinquus.*

Metacœlus Foerster.

°**M. lævis** Cresson.

Female and male: length 5-7 mm.; mostly blackish, with the legs and palpi brownish red, antennæ still darker; face with a dark red stain beneath the antennæ; propodeum completely areolated.

Triclistus Foerster.

Key to Species.

1. Thorax and abdomen mostly black 2
   Thorax and abdomen reddish or nearly so; hind tibiæ not annulate, without white annuli; face white; thorax with white markings; areolet wanting. Length 6 mm. (female and male) .... **atriceps**
2. Face and abdomen entirely black; coxæ and legs reddish Length 7-8 mm. (female and male) .... **curvator**
   Face yellow to dusky red; abdomen beneath and its ultimate and penultimate dorsal segments reddish. Length 8 mm. (female and male) .... **apicalis**

°**T. atriceps** Walsh.

°**T. apicalis** Cresson.

°**T. curvator** Fabricius.

Chorineus Holmgren.

Key to Species.

1. Metapleuræ entirely smooth, or with two or three short carinæ converging to the junction with hind coxæ........ 2
 Metapleuræ longitudinally pitted; mesopleuræ longitudinally or diagonally pitted above mid coxæ; three distinct carinæ on third dorsal abdominal segment; upper part of metapleuræ smooth and polished, hind femora reddish. Length 4-6 mm. (female and male) ....**costatus**
2. Second dorsal abdominal segment scabrous, with one or more carinæ, no constriction between this segment and third; face yellow. Length 6-7 mm. (female and male)....**carinatus**
 Second dorsal abdominal segment with a median and two distinct lateral carinæ; propodeum with six or seven carinæ; basal dorsal abdominal segment with five carinæ; face yellow or reddish yellow. Length 6-7 mm (female and male ....**cariniger**

***C. costatus** Davis.

C. cariniger Walsh.

***C. carinatus** Cresson.

Alcocerus Foerster.

°**A. trifasciatus** Cresson.

Female and male: length 9-10 mm.; mostly black, with yellow markings as follows: antennæ, palpi, tegulæ, scutel, apical third of first, second and third dorsal abdominal segments, genitalia, more or less of coxæ and femora, trochanters, tarsi, and tibiæ except tips of hind pair; wings dusky hyaline.

Periope Curtis.

P. æthiops Cresson.

Male: length 7 mm.; mostly black, with the tegulæ, a stripe beneath the latter, fore legs beyond the middle of their femora, basal half of mid and hind tibiæ, apex of mid femora, and most of venter, yellow; tarsi of mid and hind legs yellowish brown; areolet present, triangular.

Pseudometopius Davis.

°**P. hageni** Cresson.

Female and male: length 14 mm. Female: mostly black, with yellowish white markings as follows: short line along the margin of the face in the emargination of the eyes, an inverted U beneath antennæ, spot beneath eyes, labrum, clypeus excepting two black dots, palpi, most of mandibles, tegulæ, a line beneath the latter, spot on anterior pleuræ, apex of scutel, fore and mid legs except coxæ and hind portion of femora, and basal portion of hind tibiæ and tarsal segments; areolet subpetiolate. Male differs in having the entire face, spot on scape beneath, and more or less of the legs, yellowish white.

Metopius Panzer.

An undetermined species of this genus has been bred from Bombycids and Noctuids in Europe.

M. pollinctorius Say.

Female and male: length 13-16 mm.; facial shield without a distinct median carina; thorax black, with yellow markings; abdomen with most of the dorsal segments apically margined with yellow, but only the apical corners of the second segment yellow; basal segment pyramidal, bituberculate, mostly yellow; apex of scutel more or less yellow; hind tibiæ and tarsi black or blackish, or with a faint yellow line on tibiæ beneath.

Westville, 19 September, 1904 (W. E. B.).

Grotea Cresson.

°**G. anguina** Cresson.

Length 14-17 mm.; mostly brown or brownish stramineous maculated with yellow; wings clear; fore and mid legs mostly yellow; hind legs largely brownish stramineous; exserted portion of ovipositor about half the length of the abdomen.

Labena Cresson.

°**L. grallatrix** Say. Howard, Insect Book, Pl. x, Fig. 25.

Length 14-21 mm.; body more or less brown, variegated with brownish yellow to yellow; wings dark brown, with a more or less distinct, oblique, subhyaline or hyaline streak beyond the basal half; exserted portion of ovipositor about as long as the abdomen.

Euxorides Cresson.

***E. (Calliclisis) americanus** Cresson.

Length 11.5 mm.; body mostly black; scape and pedicel beneath, palpi, tubercles, tegulæ, bases of wings, lower border of prothorax, and most of fore and mid legs, yellow or yellowish; mandibles and all tarsi more or less brown; hind coxæ and their femora mostly reddish stramineous, the latter tinged with brownish above, especially at base and apex; their proximal trochanters mostly brown, their distal trochanters mostly yellow; hind tibiæ almost entirely concolorous with their tarsi; wings hyaline, tinted with brown, stigma and veins dark; more or less of the dorsal abdominal segments with a rather obscure apical margin of a yellowish hue; exserted portion of ovipositor about half the length of the abdomen.

Xylonomus Gravenhorst.

Key to Species.

1. Body either without pale markings or with inconspicuous ones 2
   Body conspicuously marked with yellow, length 12 mm.; exserted portion of ovipositor about as long as abdomen; wings transparent, tinted with brownish; fore and mid legs mostly stramineous, hind legs mostly brown; antennæ of female with a yellow annulus near their tips, of male apparently uniformly brown ....**albopictus**
2. Almost uniformly blackish or black, legs included, except knees, base of tarsi, an annulus near apex of tarsi and an annulus near middle or at middle of antennæ, all of which are more or less yellow; wings darker than in *albopictus;* length 10-24 mm.; exserted portion of ovipositor about as long as body; antennæ of male uniformly dark brown or blackish ....**stigmapterus**
   Color mostly as in *stigmapterus*, from which it differs notably in the tegulæ, which are brownish stramineous, in the pale annulus of the female antennæ being near the tips of the same, and in the fore and mid legs being almost entirely reddish stramineous. Length 15 mm. or somewhat shorter **humeralis**

°X. **albopictus** Cresson.

°X. **stigmapterus** Say.

°X. **humeralis** Say.

Xorides Gravenhorst.

°X. **vittifrons** Cresson.

Female: length 15-20 mm.; a rather M-shaped mark below the border along the inner orbits, a mark on the malar space, and upper edge of pronotum, yellow; scutel and postscutel each with a transverse yellow mark; scape and pedicel brown; mandibles black; wings rather yellowish brown; legs almost entirely stramineous to reddish stramineous, except tips of mid and hind femora above and more or less of mid and hind tibiæ and tarsi, which are more or less brown; exserted portion of ovipositor about as long as the body; yellow bands on dorsum of abdomen conspicuous. Male: differs in having all of the face below antennæ except clypeus and mandibles which are mostly black, first, second, third and fourth joints of antennæ partly, lower margin of pronotom, fore and mid coxæ and trochanters and articulating ends of fore and mid tibiæ and of hind coxæ and tibiæ basally, more or less luteous or yellow; otherwise about as in the female, but with the hind femora mostly brown above, reddish below; first, second, third and fourth dorsal abdominal segments each with an apical yellow band.

Odontomerus Gravenhorst.

Wings transparent, with a dark tint; head and thorax almost entirely black; exserted portion of ovipositor nearly one and one-half times as long as the body, which is 15 mm. long or less.

Key to Species.

Abdomen and legs almost entirely reddish ....**bicolor**
Abdomen black; legs, except hind tibiæ and tarsi, which are
brown, reddish stramineous or stramineous...........**mellipes**

O. mellipes Say.

New Haven, 14 August, 1905, Colebrook, 21 July, 1905 (H. L. V.); Yalesville, 17 June, 1903 (W. E. B.).

°**O.** bicolor Cresson.

Phytodietus Gravenhorst.

Mostly black; wings hyaline; legs mostly reddish; abdomen banded with yellow above; exserted portion of ovipositor somewhat longer than the abdomen. Length 4-9 mm.

Key to Species.

Dorsulum without maculations; hind legs reddish, except
their tibiæ and tarsi, which are mostly brown ....**distinctus**

Dorsulum maculated with yellow; legs reddish, except proximal trochanters, which are mostly black, distal trochanters and extreme base and apex of femora, which are yellow, a brown annulus near base and apex of latter, extreme bases of their tibiæ and line on the tibiæ, which are yellowish, and rest of tibiæ and all their tarsi, which are dark brown .... **vulgaris**

P. vulgaris Cresson.

Poquonock, 27 June, 1905; New Haven, 22 June, 1904 (H. L. V.).

°**P. distinctus** Cresson.

Meniscus Schiödte.

Key to Species.

1. Wings uniformly hyaline; body mostly black 2
Wings hyaline, tipped with fuscous; head and thorax black, maculated with yellow; fore and mid legs mostly yellow, hind pair mostly brown; abdomen reddish, with first and second dorsal segments blackish, banded with yellow; length 8-12 mm.; exserted portion of ovipositor equalling or exceeding abdomen in length..................... **elegans**

2. Sternum and sides of thorax more or less pale, reddish stramineous or reddish 3
Sternum and sides of thorax mostly or entirely black; fore and mid coxæ and trochanters stramineous and yellowish, their femora stramineous; hind coxæ and trochanters reddish stramineous, hind knees yellowish, hind femora mostly brown, reddish on basal half; fore tibiæ reddish stramineous; mid tibiæ brownish stramineous; hind tibiæ brown, with a basal whitish annulus, their metatarsi whitish, their tarsi otherwise brown; fore tarsi stramineous to brownish stramineous; mid tarsi brownish; exserted portion of ovipositor about half the length of abdomen. Length 11 mm. .... **superbus**

3. Thorax with its pleuræ and sternum partly or mostly reddish 4
Thorax partly or mostly yellow on its pleuræ and sternum; face and cheeks mostly yellow; dorsum of thorax maculated with yellow; apical margin of dorsal abdominal segments with a rather broad yellowish band; fore and mid legs mostly yellow, hind legs mostly stramineous to reddish stramineous, their coxæ yellow, with a black stripe and an apical brown annulus .... **pulcherrimus**

4. Very like *superbus*, but without an annulus at base of hind metatarsi; exserted portion of ovipositor longer than in *superbus* .... **scutellaris**

Length 7 mm.; exserted portion of ovipositor a little longer than body; abdomen narrowly banded with yellow at apex of some of dorsal segments; fore and mid coxæ mostly yellow; hind coxæ black, striped with yellow; trochanters mostly yellow; femora and tibiæ mostly brownish stramineous; hind femora with an especially dark brown annulus at apex, fore tarsi stramineous; middle tarsi brownish stramineous; hind tarsi mostly brown ......**mirabilis**

***M. pulcherrimus** Cresson.

Type locality: Connecticut (E. N.).

M. superbus Provancher, Pl. ix, Fig. 3.

Torrington, 7 July, 1905 (W. E. B.), at flowers of manna grass (*Glyceria*); Colebrook, 21 July, 1905 (H. L. V.), on flowers of water hemlock (*Cicuta maculata*).

M. elegans Cresson.

West Thompson, 12 July, 1905 (H. L. V.).

°**M. (Bathycetes) scutellaris** Cresson.

°**M. (Asphragis) mirabilis** Cresson.

Lissonota Gravenhorst.

Lampronota Curtis.

Key to Species.

1. Abdomen entirely or almost entirely black above............ 2
Abdomen above more or less pale colored 7
2. Hind coxæ reddish 3
Hind coxæ practically entirely black; hind legs with a broad white annulus at bases of their tibiæ; face and tegulæ white. Length 11-12 mm. ....**tegularis**
3. Pleuræ unicolorous 4
Pleuræ variegated with a yellow or reddish mark before mid coxæ; scutel more or less whitish 6
4. Pleuræ and scutel black; abdomen punctate................ 5
Pleuræ and scutel whitish. Length 10 mm. ....**pulchella**
5. Mesonotum with its lateral margin before tegulæ more or less yellow; hind femora not black at tips; dorsal abdominal segments entirely black; length 9 mm.; exserted portion of ovipositor as long as or longer than abdomen ....**insita**
Mesonotum black, immaculate; length 6-8 mm.; exserted portion of ovipositor as long as or longer than abdomen **punctulata**
6. Length 12-13 mm.; areolet petiolated; abdomen coarsely punctate; length of exserted portion of ovipositor about as in *insita* ....**cressoni**

Length 6-8 mm.; areolet petiolated; exserted portion of ovipositor somewhat shorter than body ....**pleuralis**

7. Abdomen above reddish and black or yellowish and black.. 8

Abdomen above entirely reddish; thorax black.............. 15

8. Base and apex of abdomen black............................ 9

Base or apex of abdomen black, but not both 13

9. Legs mostly pale yellowish, hind femora and tarsi blackish; scutel more or less yellow 10

Legs at least partly reddish 12

10. Pale portion of abdomen above yellow or yellowish red. Length 11.5-12 mm. ....**varia**

Pale portion of abdomen above reddish 11

11. Hind coxæ yellow at apex and without a long yellow stripe Length 11 mm. ....**appalachia**

Hind coxæ yellow at apex and with a long yellow stripe Length 13.5 mm. ....**relativa**

12. Scutel black; length 7-8 mm.; exserted portion of ovipositor as long as or a little longer than body ....**frigida**

Scutel yellow. Length 7-9 mm. (male) ....**philipi**

13. Base, only, of abdomen black............................ 14

Apex, only, of abdomen black; length 7-8 mm.; exserted portion of ovipositor about as long as abdomen ....**agilis**

14. Legs entirely black; length 12 mm.; exserted portion of ovipositor about as long as body ....**americana**

Legs mostly reddish to stramineous, partly brown and yellow (male) ....**philipi**

15. Scutel black; length 9 mm.; exserted portion of ovipositor about 9 mm. long ....**exilis**

Scutel more or less yellow; exserted portion of ovipositor and body as long as in *exilis* ....**rubrica**

***L. (Nadia) appalachia** (Viereck).

***L. cressoni**, new name. *L occidentalis* Cresson (preoccupied).

***L. punctulata** (Cresson).

***L. rubrica** (Cresson).

New Haven, 10 July, 1905, Scotland, 10 August, 1905 (B. H. W.); West Haven, 27 September, 1905 (H. L. V.).

***L. exilis** (Cresson).

***L. philipi** Viereck (new species).

Head and thorax mostly black; abdomen mostly pale; scape and pedicel in front, face beneath antennæ and along the inner eye margins above the insertion of antennæ, superior and inferior margins of pronotum, a mark on each side of mesonotum, greater part of lower half of mesopleuræ, nearly all of mesosternum, scutel, spot on metapleuræ, and the coxæ of fore and mid legs, yellow; femora and tibiæ of fore and mid legs reddish stramineous, the tarsi of fore and mid legs brownish; hind legs almost entirely reddish; first segment of abdomen black above, except for an apical yellowish margin; second dorsal abdominal segment black, barring the apical and basal margins, which are yellowish; rest of dorsum of abdomen more or less reddish stramineous, with an addition of dusky spots or stains in some cases.

Variations occur in the extent of the yellow on the thorax, in the extent of black on the second dorsal abdominal segment, and in the pale color of the dorsum of the abdomen being reddish in some individuals, but the pattern is always essentially as in the type.

Type locality: New Haven, 19 July, 1905 (B. H. W.), 6 July, 1904, 4 July, 1905 (H. L. V.); also from Branford, 28 July, 1905 (H. L. V.).

L. (Alloplasta) varia (Cresson).

Colebrook, 21 July, 1905 (H. L. V.).

L. (A.) americana (Cresson). Howard, Insect Book, Pl. x, Fig. 3.

°**L. (A.) tegularis** (Cresson).

°**L. (A.) pulchella** (Cresson).

°**L. (A.) pleuralis** (Cresson).

°**L. (A.) insita** (Cresson).

°**L. (Harrimaniella) relativa** (Viereck).

L. frigida (Cresson).

Yalesville, 19 October, 1903 (H. L. V.). Parasitic on a species of sawfly (*Nematus*).

°**L. agilis** (Cresson).

Arenetra Holmgren.

Mostly black; wings hyaline; pubescence rather long and dense; head and thorax with their pubescence whitish.

Key to Species.

Tegulæ and hind femora black	nigrita
Tegulæ yellowish white	ventralis

°**A. nigrita** Walsh.

°**A. ventralis** Cresson.

Glypta Gravenhorst.

Key to Species.

1. Black, or black and reddish stramineous and reddish with pale markings 2

Black, variegated with white; length 7 mm.; face, including mandibles, more or less white; palpi, ventrum and sides of thorax, tegulæ, clypeus, scutel, and postscutel, white; rest of thorax above, abdomen beneath, and its dorsal segments at base and apex, all more or less white; coxæ and trochanters of fore and mid legs, and most of hind tarsi, white; rest of legs mostly yellowish red; wings hyaline, veins and stigma dark; exserted portion of ovipositor as long as abdomen ....**phoxopteridis**

2. Body above almost entirely black 3

Body above extensively maculated with luteous or whitish; thorax above mostly reddish stramineous; head mostly luteous; abdomen banded; fore and mid legs stramineous; hind legs varicolored, their tibiæ each with two luteous annuli; first tarsal joint of hind legs with a basal luteous annulus; length 5-10 mm.; exserted portion of ovipositor about three-fourths the length of abdomen ....**scitula**

3. Thorax beneath more or less reddish 4

Thorax black, except tubercles and tegulæ, which are yellowish; antennæ dark brown; legs mostly reddish stramineous; hind femora and tibiæ brown at apex; the latter brown above and with a brown annulus separated from the base by a yellowish annulus, greater part of their middle half yellowish; tarsi of hind legs brown, with first, second, and third joints yellowish at base; propodeum not areolated; length 7-8 mm.; exserted portion of ovipositor a little longer than abdomen ....**erratica**

4. Legs in color about as in *erratica*, but otherwise differing from that species and *vulgaris*........................... 5

Legs nearly the same color as in *erratica;* exserted portion of ovipositor longer than abdomen; tegulæ and tubercles yellow; scutel pale. Length 6.5 mm. ....**vulgaris**

5. Length less than 10 mm. 6

Length 10 mm.; hind legs reddish stramineous or reddish, with apex of femora brownish, tibiæ mostly dark brown, partly dark reddish, tarsi all dark brown; exserted portion of ovipositor about as long as abdomen ....**simplicipes**

6. Thorax with pronotum yellowish; length 7.5 mm.; exserted portion of ovipositor about 7.5 mm. long ....**animosa**

Collar or pronotum black, scutel pale; male antennæ pale yellowish or orange; propodeum areolated; length 7-9 mm.; exserted portion of ovipositor a little shorter than abdomen ....**rufiscutellaris**

***G. rufiscutellaris** Cresson.

°**G.** (**Conoblasta**) **vulgaris** Cresson.

°**G.** (**C.**) **erratica** Cresson. Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 7.

Parasitic on (*Grapta*) *Polygonia comma.*

°**G. animosa** Cresson.

°**G. simplicipes** Cresson.

°**G. phoxopteridis** Weed.

Parasitic on the strawberry leaf-roller (*Phoxopteris comtana*).

°**G.** (**Toxophoroides**) **scitula** Cresson.

Clistopyga Gravenhorst.

C. annulipes (Cresson). *Glypta annulipes* Cresson, Ashmead.

Female: length 12 mm.; mostly black; pale as follows: more or less complete inner orbital margin, clypeus, part of mandibles, mark on each cheek near mandibles, palpi, superior lateral margin of pronotum, tubercles, tegulæ, extreme bases of wings, most of fore legs, a nearly median annulus on mid and hind tibiæ, and basal portions of tarsi of mid and hind legs, yellowish; coxæ, trochanters, and femora of mid and hind legs, reddish; tibiæ and tarsi of mid and hind legs mostly brown or brownish; dorsal abdominal segments with their apical edges yellow; exserted portion of ovipositor nearly half the length of the abdomen.

Stonington, 1 June, 1906 (B. H. W.).

Polysphincta Gravenhorst.

P. rubricapensis Provancher.

Length 5-6 mm.; mostly black; antennæ mostly dark brown, tipped with brownish yellow, palpi pale; wings transparent, tinted with brown; stigma and veins brown; legs stramineous to reddish stramineous, except mid and hind tarsi, which are brown with the basal portion of the joints annulated with yellowish, and mid and hind tibiæ, which are brown with a yellowish annulus at extreme base and a yellowish annulus occupying practically the middle third; exserted portion of ovipositor about two-thirds the length of the abdomen.

Torrington, 7 July, 1905 (W. E. B.).

P. texana Cresson.

Female: length 8 mm.; mostly black; antennæ dark brown throughout; fore coxæ mostly brown to blackish but with stramineous tips; mid legs with their tibiæ dark beneath, mostly yellow above, but with an apical and a sub-basal brown mark, their tarsi brown, except the basal joint, which is mostly yellow, and with an apical brownish band; hind femora with the apical third dusky; the hind tibiæ beneath dark brown or rather blackish, above with the basal two-fifths black, the following three-tenths whitish, the rest black; tarsi of hind legs black, but with the basal half of the first joint yellow; exserted portion of ovipositor about as long as the mid femora.

Mr. R. A. Cushman has reared this species from the spider *Steatoda borealis.*

***P. pontiaci** Viereck (new species).

Male: length 6 mm.; fore coxæ stramineous; fore and mid legs stramineous, except tip of mid tibiæ and tip of first joint of mid tarsi; hind trochanters whitish; hind coxæ and femora reddish stramineous, apex of latter brownish; basal sixth of hind tibiæ whitish, next sixth brown, following third whitish, apical third brown; tarsal joints whitish to yellowish to brown; antennæ yellowish beneath, brown above; otherwise much the same in color as *texana.*

Type locality: Cheshire, 8 July, 1904 (H. L. V.).

Scambus Hartig.

Pimpla Authors, not Fabricius.

Body mostly black; wings transparent; more or less deeply tinted with brownish or yellowish brown; fore and mid legs almost without exception stramineous to reddish stramineous; hind legs as a rule with coxæ, trochanters, and femora stramineous to reddish, their tibiæ and tarsi usually varicolored.

Key to Species.

Most or all of abdomen above black	2
Most of abdomen reddish	16

2. Legs yellowish red; hind pair varied with black or white or both 3

Legs entirely yellowish red or red, sometimes infuscated.... 15

3. Hind tibiæ and tarsi entirely black or fuscous; length 8-14 mm.; exserted portion of ovipositor a little longer than thorax ....**pedalis**

Hind tibiæ and tarsi blackish or dark brown, annulated with whitish, or only the former annulated 4

4. Hind tarsi entirely blackish or fuscous.................... 5

Hind tarsi not entirely blackish or fuscous................. 6

5. Scutel black; tegulæ and fore coxæ black; length 6-10 mm.; length of exserted portion of ovipositor as in *marginatus*...... **tenuicornis**

Scutel black; tegulæ white; fore coxæ yellowish red; length 5-13 mm.; exserted portion of ovipositor a little shorter than thorax ....**marginatus**

6. More than one joint of hind tarsi partly whitish........... 7

Only basal half of first joint of hind tarsi whitish; tibiæ black and with a whitish annulus near base; antennæ fuscous above, yellowish beneath, with black sutures; mesonotum with two short white lines; scutel white. Length 8 mm. ....**picticornis**

7. Hind tarsi white, their joints tipped with blackish, with the exception of the fourth joint, at least in *conquisitor*, which is entirely dark brown or black 8

Hind tarsi with only first and second joints mostly white, tipped with blackish; scape white; length 4-6 mm.; exserted portion of ovipositor about as long as head and thorax combined ....**indagator**

8. Antennæ brown or reddish 9

Antennæ pale yellowish, with black sutures; length 9-11 mm.; exserted portion of ovipositor a little longer than head and thorax combined ....**annulicornis**

9. Dorsal abdominal segments without a whitish margin; areolet complete 10

Dorsal abdominal segments apically with a whitish margin; length 5-15 mm.; exserted portion of ovipositor about as long as thorax or somewhat shorter ....**conquisitor**

10. Pleuræ black 11

Pleuræ more or less red; clypeus more or less, anterior orbits, tegulæ, a line before the scutel, and tip of scutel, white 14

11. Head of female entirely black; face of male whitish.......... 12

Only clypeus, scape beneath, tegulæ and most of fore and mid legs, white. Length 6-9 mm. (male) ....**alborictus**

12. Areolet sessile 13

Areolet petiolate ....**inquisitoriellus var. investigator**

13. Length 5-11 mm.; exserted portion of ovipositor a little longer than thorax .... **inquisitoriellus**
Length 10 mm.; exserted portion of ovipositor 7 mm. long .. **tecumseh**

14. Pleuræ almost entirely red; two dots below antennæ, a dot on each side of propodeum, and all of clypeus, white; length 6-10 mm.; exserted portion of ovipositor about as long as thorax .... **rufopectus**
Pleuræ red only before mid coxæ; tip of clypeus more or less blackish; no white dots below insertion of antennæ; propodeum immaculate; size of body and ovipositor practically as in *rufopectus* .... **scriptifrons**

15. Thorax entirely black, smooth, and polished; length 8-10 mm.; exserted portion of ovipositor longer than thorax .. **pterelas**
Mesopleuræ and scutel reddish; length 6-10 mm.; exserted portion of ovipositor distinctly longer than abdomen.. **notandus**

16. Legs reddish; length 4-8 mm.; exserted portion of ovipositor shorter than thorax .... **rufovariatus**
Legs mostly yellowish; head mostly black; thorax brownish stramineous, propodeum castaneous; length 12 mm.; exserted portion of ovipositor as long as or slightly longer than body .... **grapholithæ**

***S. (Scambus) tecumseh** Viereck (new species).

Type locality: West Haven, 27 July, 1905 (H. L. V.).

S. (S.) notandus (Cresson).

Yalesville, 12 October, 1906 (W. E. B.).

S. (S.) pterelas (Say).

Stonington, 2 August, 1906 (J. A. Hyslop); Sachem's Head, 1 August, 1904, Rockville, 23 August, 1905 (H. L. V.); Torrington, 7 July, 1905 (W. E. B.).

S. (Pimplidea) pedalis (Cresson).

Has been bred from the following: Galls of *Saperda concolor*, the American tent-caterpillar (*Malacosoma americana*), *M. disstria, Isia isabella*, the gipsy moth (*Porthetria dispar*) and *Tortrix fumiferana.*

Lyme, 29 May, 1910, Thompson, 4 May, 1910 (A. B. C.); New Haven, 6 July, 1904, 31 October, 1903 (H. L. V.), 19 August, 1904 (P. L. B.), 7 August, 1905, 27 April, 1907, 2 May, 1913 (W. E. B.), 30 July, 1911 (A. B. C.); Portland, 8, 15 August, 1913, (B. H. W.); Meriden, May, 1913 (H. L. Johnson).

°**S. (P.?) annulicornis** (Cresson).

S. (Iseropus) inquisitoriellus (Dalla Torre). *Pimpla inquisitor* Say. Howard, Insect Book, Fig. 38 (adult stage), Fig. 39 (early stages), Fig. 40 (cocoons). Morley * regards this as a synonym of the European (*Epiurus*) *Scambus graminellæ* Schrank.

Is on record as a primary parasite of the American tent-caterpillar (*Malacosoma americana*) and as a secondary parasite of the beneficial *Ameloctonus fugitivus,* also as an important parasite of the white-marked tussock moth caterpillar (*Hemerocampa leucostigma*); has been reared from egg cocoons of the spiders *Argiope riparia* and *Epeira angulata,* and from larvæ feeding externally on the caterpillar of *Laverna eloisella* feeding within the stems of *Œnothera;* other hosts are as follows: bag-worm (*Thyridopteryx ephemeræformis*), *Gnorimoschema gallæsolidaginis, Grapholitha olivaceana, Coleophora cinerella,* an unknown leaf-roller on ash, *Phycita juglandis,* an unknown Californian Tineid, *Malacosoma constricta,* and *M. californica.*

Berlin, 30 June, 1905 (W. E. B.); Branford, 3 September, 1904 (H. L. V.); New Haven, 6, 14 August, 1906 (P. L. B.). Bred from larva of *Malacosoma americana* collected at Stonington, June, 1913 (W. E. B.).

S. (I.) inquisitoriellus var. investigator (Walsh).

Canterbury, 14 August, 1905 (B. H. W.).

S. (Itoplectis) conquisitor (Say). *Pimpla conquisitor* Say. Howard, Insect Book, Pl. ix, Fig. 10.

According to Fiske this is perhaps the most common hymenopterous parasite of the American tent-caterpillar (*Malacosoma americana*). Other hosts are the forest tent-caterpillar (*Malacosoma disstria*), the white-marked tussock moth (*Hemerocampa leucostigma*), the bag-worm (*Thyridopteryx ephemeræformis*), the cotton worm (*Aletia argillacea*), *Phryganidea californica, Mineola indigenella, Phacellura hyalinitalis,* an unknown Texan Tortricid on cedars, *Argirolepia quercifoliana, Archips cerasivorana,* (*Rogas*) *Aleiodes intermedius* and *Ameloctonus fugitivus.*

The records of W. E. B., H. W. W., E. J. S. M., P. L. B., J. A. Hyslop, and H. L. V. collectively indicate the occurrence of this species throughout the state in May, June, July, August, and October. Bred from larvæ of *Malacosoma americana* collected at Stonington, June, 1913 (W. E. B.); New Haven, 9 October, 1911 (W. E. B.); Portland, 10 August, 1913 (B. H. W.).

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* Revision of Ichneumonidæ, Part iii, 1914.

S. (I.) marginatus (Provancher). *Pimpla annulipes* Authors, not Brullé. Pl. ix, Fig. 10. Morley * regards this as a synonym of the European *Scambus turionellæ* (Linnæus).

This is an American parasite of the cosmopolitan codling moth (*Carpocapsa pomonella*); other hosts are: (*Apatura*) *Chlorippe clyton* (?), (*Papilio*) *Iphidicles ajax*, the white-marked tussock moth (*Hemerocampa leucostigma*), and the lesser peach borer (*Synanthedon pictipes*).

Stonington, 26 July, 1906 (J. A. Hyslop), 19 June, 1 July, 1906 (B. H. W.); North Haven, 3 August, 1905 (H. L. V.); West Haven, 21 May, 1910 (A. B. C.), 29 June, 1905 (W. E. B.); New Haven, 25 May, 1905 (B. H. W.), 20 July, 1906 (W. E. B.).

S. (Delomerista) tenuicornis (Cresson). Morley * regards this as a variety of the European *Scambus turionellæ*. (Linnæus).

Parasitic on *Sesia caudata*.

Branford, 1 July, 1905 (H. W. W.); Milldale, 21 May, 1906 (B. H. W.); New Haven, 4 May, at flowers of honeysuckle (*Lonicera fragrantissima*) (H. L. V.).

S. (Calliephialtes) grapholithæ (Cresson).

Host: *Grapholitha caryana*, an inhabitant of hickory nut hulls.

Storrs, 26 October, 1905 (W. E. B.).

S. (Tromatobia) rufopectus (Cresson).

Reared from the cocoons of an Epeirid spider in May by W. H. Patton.

S. (T.?) picticornis (Cresson).

°**S. (T.) scriptifrons** (Cresson).

°**S. (T.?) alborictus** (Cresson). Belongs to the subgenus *Scambus*, according to Morley.*

°**S. (T.) rufovariatus** (Cresson).

°**S. (Eremochila) indagator** (Walsh). Morley* regards this as a synonym of the European *Scambus detritus* (Holmgren).

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* Revision of Ichneumonidæ, Part iii, 1914.

Theronia Holmgren.

°**T. atalantæ fulvescens** Cresson.

Length 6-12 mm.; entirely stramineous, with yellowish transparent wings; exserted portion of ovipositor shorter than the abdomen.

Parasitic on *Scambus conquisitor,* a primary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*), and a tertiary parasite on the American tent-caterpillar (*Malacosoma americana*), also a parasite on the gipsy moth (*Porthetria dispar*).

T. melanocephala Brullé.

Possibly parasitic on *Scambus pedalis,* and a parasite on the gipsy moth (*Porthetria dispar*). Bred from (*Eudamus*) *Epargyreus tityrus* by A. B. Champlain. Readily distinguished from *fulvescens* by the head, which, as the name indicates, is black in *melanocephala.*

Portland, 10 August, 1913 (B. H. W.).

Hymenoepimecis Viereck.

Epimecis Brullé.

°**H. wilti** (Cresson).

This is a conspicuous species about 15 mm. long, with its head, including antennæ, almost entirely black; rest of body stramineous to brownish stramineous, except the abdomen at apex, where it is blackish, and sheaths of ovipositor, which are blackish; exserted portion of ovipositor approximately four-fifths as long as the abdomen; wings yellowish transparent, with a fuscous border apically in the fore wings, and a median fuscous band in the same extending from the anterior margin to the posterior edge.

Ichneumon Linnæus.

Ephialtes Gravenhorst.

Wings transparent, colorless, or tinted with yellowish brown; head and thorax mostly black.

Key to Species.

1. Abdomen above entirely or mostly black.................. 2
   Abdomen above mostly red; length 13-20 mm.; exserted portion of ovipositor a little longer than body; fore and

mid legs mostly yellow, hind legs mostly brownish stramineous, except their coxæ, which are black ....irritator

2. Length over 14 mm. 3

Length less than 14 mm. 4

3. Exserted portion of ovipositor much longer than body; legs mostly brownish stramineous, except hind tibiæ and hind tarsi, which are brown ....tuberculatus

Exserted portion of ovipositor not much longer than body; legs as in *tuberculatus* ....mesocentrus

4. Exserted portion of ovipositor as long as or shorter than body 5

Exserted portion of ovipositor longer than body; legs as in *tuberculatus* ....macer

5. Exserted portion of ovipositor as long as body; legs as in *tuberculatus* ....comstocki

Exserted portion of ovipositor shorter than body; fore and mid legs yellow, except their tarsi, which are more or less brownish; hind legs in female with coxæ and femora mostly reddish stramineous, their trochanters, tibiæ, and tarsi mostly brown; in male, hind coxæ stramineous and femora of hind legs mostly brown ....albipes

I. **irritator** (Fabricius). Howard, Insect Book, Pl. x, Fig. 8.

This is an American parasite of the cosmopolitan beetle *Cryptorhynchus lapathi.* Also parasitic on *Liopus variegatus.*

Salisbury, 27 August, 1904 (W. E. B.); New Haven, 21 April, 1911 (A. B. C.).

I. **tuberculatus** (Fourcroy).

°I. **(Calliephialtes) comstocki** (Cresson).

Tegulæ white; veins fuscous, stigma also fuscous, but with a pale spot at base. Parasitic on *Evetria comstockiana,* which bores into the twigs and small branches of the pitch pine (*Pinus rigida*).

°I. **albipes** (Cresson).

°I. **mesocentrus** (Gravenhorst). *Ephialtes rex* (Kriechbaumer).

°I. **macer** (Cresson).

Megarhyssa Ashmead.

Thalessa Holmgren.

Key to Species.

1. Wings without dark patches.............................. 2

Wings with dark patches, otherwise transparent, tinted with yellowish or brownish yellow; length of most specimens much more than 15 mm. 4

2. Length much more than 15 mm. 3
Length less than 15 mm.; thorax and abdomen entirely black **nitida**

3. Female mostly blackish, with fuscous wings; male mostly dark brown, with a dark brown median stripe or area on propodeum; exserted portion of abdomen about as in *lunator* .... **atrata**
Both sexes mostly pale brown; wings not fuscous; male without a median dark brown area or stripe on propodeum; exserted portion of ovipositor about as in *lunator;* abdomen laterally with yellow spots, at least in female ..... **nortoni**

4. Body mostly pale brown in color; exserted portion of ovipositor not much longer than body, or about twice the length of body 5
Body mostly dark brown in color; exserted portion of ovipositor somewhat more than twice the length of the body; fore wings dark brown along basal vein as well as elsewhere .... **lunator**

5. Fore wings dark brown along basal vein as well as elsewhere; exserted portion of ovipositor twice as long as the body .... **lunator**
Fore wings not dark brown, except in basal third of radial cell, or in its basal half, and in part of adjoining portion of cubitodiscoidal cell .... **greenei**

M. atrata (Fabricus). Pl. ix, Figs. 5, 6. Howard, Insect Book, Pl. ix, Fig. 1.

New Haven, 25 May, 1896 (W. C. Sturgis), June, 1906 (W. E. B.), August, 1906 (B. H. W.).

M. lunator (Fabricus). Pl. ix, Fig. 4. Howard, Insect Book, Pl. ix, Figs. 3, 4; Text Figs. 35, 36.

Parasitic on *Tremex columba.*

New Haven, 25 May, 1896, 25 May, 1898, 4 August, 1896 (W. C. Sturgis), June, 1906 (W. E. B.), August, 1906 (B. H. W.).

M. nortoni (Cresson). Howard, Insect Book, Pl. viii, Fig. 38.

M. nitida (Cresson).

Wallingford, 30 November, 1912 (D. J. Caffrey).

M. greenei Viereck.

New Haven, 10 August, 1909 (A. I. Bourne).

Rhyssa Gravenhorst.

Nearly as large as *Megarhyssa;* black, with yellow markings; wings transparent and tinted with yellowish or yellowish brown; legs mostly reddish stramineous.

Key to Species.

Antennæ with a yellow annulus .... **albomaculata**
Antennæ without a yellow annulus, but uniformly blackish.. **persuasoria**

R. albomaculata Cresson.

Hamden, 15 June, 1911 (W. E. B.).

°**R. persuasoria** Linnæus.

Arotes Gravenhorst.

Length 10-17 mm.; antennæ with a yellow annulus or with the greater part of the apical half yellowish except tips.

Key to Species.

1. Second recurrent vein interstitial with cubital vein.......... 2
   Second recurrent vein not interstitial with cubital vein...... 4
2. Mostly black, with yellowish maculæ 3
   Stramineous, with black maculæ; exserted portion of ovipositor about as long as abdomen .... **venustus**
3. Hind femora black; exserted portion of ovipositor about as long as body .... **formosus**
   Hind femora testaceous; exserted portion of ovipositor longer than abdomen .... **vicinus**
4. Hind femora not black 5
   Hind femora black, tipped with yellowish; exserted portion of ovipositor as in *formosus* .... **amœnus**
5. Hind femora stramineous, tipped with black; exserted portion of ovipositor as long as or a little longer than body .. **decorus**
   Hind femora stramineous throughout or at most with extreme base brownish .... **vicinus**

A. amœnus Cresson. Howard, Insect Book, Pl. x, Fig. 24.

Colebrook, 12 July, 1905 (H. L. V.).

A. decorus Say.

°**A. vicinus** Cresson.

°**A. formosus** Cresson.

°**A. venustus** Cresson.

Coleocentrus Gravenhorst.

C. rufus Provancher.

Length 17 mm.; mostly reddish; exserted portion of ovipositor about as long as the abdomen, its sheaths blackish; wings transparent, almost clear, faintly tinged with yellowish brown.

New Haven, 30 May, 1911 (A. B. C.).

Gelis Thunberg.

Pesomachus Gravenhorst.

Key to Species.

Females.

1. Head black or fuscous 2
Head reddish or yellowish; first abdominal segment distinctly dilated at tip 6
2. Thorax at least partly black or blackish 3
Thorax uniformly pale brown .... ottawaensis
3. Thorax uniformly piceous brown or black; abdominal petiole entirely black; legs, or at least coxæ and femora, black.. 4
Thorax bicolored 5
4. Antennæ less than 40-jointed 9
Antennæ 40-jointed .... thripites
5. Thorax with its anterior node reddish, its posterior node more or less black; first abdominal segment with prominent tubercles and scarcely dilated behind them; antennæ 23-jointed .... gentilis
Thorax black; antennæ 19-jointed, reddish .... maculicollis
6. Abdomen partly black or piceous 7
Abdomen wholly reddish, sometimes very slightly infuscated; exserted portion of ovipositor as long as or longer than abdomen; antennæ 24- or 25-jointed .... unicolor
7. Length over 4 mm., or not colored as in *minimus;* exserted portion of ovipositor at least about as long as first abdominal segment 8
Length 2.5 mm. or shorter; first and second abdominal segments reddish; antennæ 25-jointed .... minimus
8. Anterior lobe of thorax with a median longitudinal groove; antennæ 24-jointed .... dimidiatus
Anterior lobe of thorax not as in *dimidiatus;* tip of abdomen pale, petiole hardly dilated, third and fourth segments more or less blackish; antennæ 18-jointed .... gracillimus
9. Antennæ 18-jointed .... nigrellus
Antennæ 24-jointed .... lymensis

Males.

1. Without wings; first abdominal segment not considerably longer than propodeum 2
With wings; head black; prothorax, legs, and abdomen, except apex, yellowish or reddish .... gentilis

2.	Head black	3
	Head not black	4
3.	Abdomen entirely black; antennæ 40-jointed	**thripites**
	Abdomen pale banded	**minimus**
4.	Head yellowish brown, antennæ 27-jointed	**macer**
	Head brownish, blackish above, antennæ 25-jointed	**ottawaensis**

G. **minimus** Walsh.

This is recorded as a parasite of the army-worm (*Leucania, Heliophila*) *Cirphis unipuncta,* but is undoubtedly parasitic on a *Protapanteles* parasite of this larva.

Hartford, 1-10 February, May, 1904 (W. E. B.).

°G. **thripites** Taylor.

Said to be parasitic on a species of *Thrips* infesting wheat in New York State. There is some doubt as to this species belonging to this genus.

°G. **dimidiatus** Cresson.

°G. **gentilis** Cresson.

°G. **unicolor** Cresson.

°G. **macer** Cresson.

°G. **gracillimus** Dalla Torre. *Pezomachus gracilis* Cresson. *P. cressonii* Strickland.

°G. **maculicollis** Brues.

Found in a nest of the ant *Leptothorax longispinosus.*

G. **ottawaensis** Harrington.

Lyme; New Haven; Ridgefield. Reared from a Drassid egg cocoon.

*G. (**Micromeson**) **lymensis** Strickland.

Type locality: Lyme, 20 April, 1911; emerged from a Drassid egg cocoon 7 May, 1911 (A. B. C.).

°G. **nigrellus** Brues.

Aptesis Foerster.

A. **microptera** (Say).

Length 5 mm.; head, thorax, most of first abdominal segment and abdominal segments beyond the third, black; basal half of antennæ and legs mostly stramineous; apex of first and all of second and third dorsal abdominal segments reddish brown; exserted portion of ovipositor about as long as the abdomen.

Mesostenidea Viereck.

Mesostenus Authors, not Gravenhorst.

Type: *Mesostenus ligator* Gravenhorst.

Wings almost clear.

Key to Species.

1. **Thorax mostly reddish 2**

Thorax mostly or entirely black 3

2. **Thorax mostly reddish, dorsulum, scutel and postscutel not reddish; length 6-11 mm.; head black, marked with yellow, antennæ with a yellow annulus; abdomen reddish, without bands, exserted portion of ovipositor nearly as long as abdomen ....thoracica**

Thorax almost entirely reddish, sutures more or less black; propodeum with a spine on each side, the spine tipped with yellow; face yellow; antennæ annulate with yellow ....arvalis

3. **Abdomen more or less reddish above...................... 5**

Abdomen banded with yellow, not reddish................. 6

4. **Petiole of abdomen, only, reddish; propodeum with yellow spots; antennæ with a yellowish annulus; length 7 mm.; abdomen banded with yellow; exserted portion of ovipositor somewhat shorter than abdomen ....exapta**

Abdomen above mostly reddish, not banded; thorax almost entirely black; length 9 mm. or nearly 5

5. **Antennæ with a yellowish annulus; exserted portion of ovipositor nearly as long as abdomen ....americana**

Antennæ without an annulus; wings with a rather deep brown tinge (male) ....prompta

6. **Antennæ with a pale annulus 7**

Antennæ without a pale annulus; length 7 mm.; hind tibiæ not annulated with yellow ....candida

7. **Length 12 mm.; hind tibiæ without a yellowish annulus; exserted portion of ovipositor shorter than abdomen........ 8**

Length 10 mm.; hind tibiæ with a yellowish annulus; exserted portion of ovipositor about half as long as abdomen ...... albomaculata

8. **Propodeum with a spinous process on each side; second dorsal abdominal segment with an apical and basal yellow band ....spinaria**

Propodeum with a tubercle on each side of posterior face; second dorsal abdominal segment with a yellow band only at apex ....fortis

M. (Polyænus) spinaria (Brullé).

Stonington, 26 August, 1906 (J. A. Hyslop).

M. (P.) prompta (Cresson). Possibly the male of *spinaria.*

M. (Mesostenidea) thoracica (Cresson).

M. (Polycyrtus) albomaculata (Cresson).

°**M. candida** (Cresson).

°**M. fortis** (Cresson).

Possibly the female of *candida.*

°**M. exapta** (Cresson).

°**M. americana** (Cresson).

°**M. (Christolia) arvalis** (Cresson).

Parasitic on *Polistes pallipes* var. *variatus.*

Acroricnus Ratzeburg.

Osprynchotus Kriechbaumer, not Spinola. *Linoceras* Taschenberg.

°**A. junceus** (Cresson).

Length 12 mm.; blackish; antennæ with a yellow annulus; head and thorax maculated with yellow; coxæ black, marked with yellow, rest of fore and mid legs practically uniformly yellow; hind legs, with the trochanters and femora, mostly black, their tibiæ and tarsi mostly yellow; exserted portion of ovipositor somewhat less than half the length of the abdomen.

Reared from a nest of *Odynerus tigris* by V. A. E. Daecke.

Joppidium Walsh.

***J. peregrinus** (Cresson). *Mesoleptus ? peregrinus* Cresson.

Length 7 mm.; mostly black; thorax partly reddish, wings hyaline, fore and mid legs mostly whitish, hind legs mostly brownish, their coxæ in the female reddish stramineous, in the male whitish.

Type locality of male: Connecticut.

Agrothereutes Foerster.

Cryptus Fabricius (preoccupied).

Key to Species.

1. Scutel more or less pale; abdomen above entirely black; or black and some other color, or reddish 2
   Scutel black; abdomen more or less red above............. 10
2. Abdomen above reddish or black with an apical yellow spot 3
   Abdomen above more or less red and black 4
3. Abdomen above mostly reddish ....**rufus**
   Abdomen above mostly black with a bluish tinge; head, including antennæ, and thorax black, legs reddish except trochanters, tibiæ and tarsi ....**hirtifrons**

4. Antennæ without a yellowish annulus 5
Antennæ with a yellowish annulus........................ 6

5. Length less than 12 mm. 7
Length 12 mm.; antennæ practically entirely black; legs reddish and black; wings brownish; exserted portion of ovipositor hardly half as long as abdomen ....**ebenus**

6. Basal half of antennæ mostly brownish; legs reddish and black; exserted portion of ovipositor more than half as long as abdomen. Length 8 mm. ....**iroquois**
Male: propodeum maculated; abdomen above blackish beyond fifth segment, except for a whitish spot at apex. Length 6 mm. ....**lophyri**

7. Length 10 or 11 mm. 8
Length 6-8 mm. 9

8. Thorax not partly reddish; abdomen above with first and second segments partly black, apical half of first and second dorsal segments pale fulvous, remaining dorsal segments dull rufo-fulvous; clypeus, scutel, a trilobed mark on proprodeum, and part of legs, yellowish; wings hyaline ...... **contiguus**
Thorax partly reddish; head black with yellow markings; exserted portion of ovipositor approximately 3 mm. long **grænicheri**

9. Abdomen above red and black, with a more or less extensive whitish or luteous band along apical edge of dorsal segments; exserted portion of ovipositor about 2 mm. long; propodeum with a blunt process on each side ..**cressoni**
Abdomen above black beyond third segment, except for an apical whitish spot; propodeum immaculate; exserted portion of ovipositor shorter than abdomen ....**lophyri**

10. Abdomen reddish and black above 11
Abdomen more or less red above, black only on apical fourth or beyond, or at extreme base.......................... 16

11. Length 8-10 mm. 12
Length 5-7 mm. 14

12. Abdomen reddish at base above, or black at base above in male, hind coxæ reddish 13
Abdomen black at base above, and in some individuals blackish toward apex; first dorsal abdominal segment usually mostly black, rest of dorsum of abdomen mostly reddish; antennæ black; legs, including coxæ and trochanters, mostly black except femora, tibiæ and tarsi, which are mostly reddish stramineous; fore coxæ white in front. Length 10 mm. ....**mundus**

13. Abdomen, at least above, yellowish to rufous; its fourth and following dorsal segments mostly black; sixth or seventh dorsal segment, or both, more or less white; exserted portion of ovipositor about as long as body; length 8-9 mm.; hind metatarsus more or less fuscous ....**extrematis**

Abdomen above in female with its basal half reddish, its apical half mostly or partly black with a whitish yellow mark at apex; abdomen of male above with its basal joint black, remainder in color as in female; antennæ in both sexes with a pale annulus; legs mostly pale, hind metatarsus entirely whitish, exserted portion of ovipositor about as long as abdomen. Length 8-9 mm. ....**nuncius**

14. Abdomen with its first, second, and third dorsal segments mostly rufous, remainder of dorsum of abdomen black except for a white apical spot. Length 5.5 mm. 15

Abdomen above, at base, and fifth and following segments, black, the rest reddish, though in some individuals the second, third, and fourth dorsal segments may be tinged with blackish. Length 6-7 mm. ....**canadensis**

15. Exserted portion of ovipositor as long as abdomen ....**alacris**

Exserted portion of ovipositor half as long as abdomen **hyslopi**

16. Antennæ with a pale annulus 17

Antennæ without a pale annulus; wings subhyaline ..**americanus**

17. Legs mostly black; exserted portion of ovipositor scarcely one-fourth the length of body; length 9-10 mm.; fore tibiæ and all tarsi more or less tinged with pale rufous ....**limatus**

Legs mostly reddish; exserted portion of ovipositor about half as long as abdomen; apical fourth of abdomen mostly black, its apex yellowish. Length 6 mm. ....**hyslopi**

A. **rufus** Provancher.

Stafford, 24 August, 1905 (W. E. B.), on flowers of goldenrod.

A. **mundus** Provancher.

New Haven, 19 July, 1905 (B. H. W.).

°A. **contiguus** Cresson.

*A. (**Itamoplex**) **lophyri** Norton.

Parasite on (*Lophyrus*) *Diprion abietis*.

Type locality: Connecticut.

A. (I.) **americanus** Cresson. Howard, Insect Book, Pl. x, Fig. 2.

Branford, August, 1905 (H. W. W.); West Haven, 27 June, 1905 (H. L. V.); New Haven, 24 August, 1905 (B. H. W.); 22 June, 1910 (A. B. C.); 4 June, 1909 (M. Jagger); Stonington, July, 1909 (G. H. Hollister); New Canaan, 27 September, 1909, Prospect, 15 August, 1906 (W. E. B.).

*A. (I.) **cressoni** Viereck (new species).

°**A. (I.) ebenus** Viereck (new species).

Type locality: Massachusetts; also from New Hampshire.

°**A. (I.) iroquois** Viereck (new species).

Type locality: New York State.

A. limatus Cresson.

New Haven, 26, 28 June, 1902 (E. J. S. M.); Cheshire, 6 May, 1903 (W. E. B.); Stamford, 25 June, 1912 (H. B. Kirk).

A. alacris Cresson.

In this species the legs, including coxæ, are entirely rufous or nearly so.

Stonington, 8 June, 1906 (W. E. B.).

A. canadensis Provancher.

Cheshire, 8 July, 1904 (H. L. V.).

A. (Apsilops) hirtifrons Ashmead.

West Hartford, 29 August, 1904 (H. L. V.).

°**A. (Habrocryptus) grænicheri** Viereck.

Parasitic on *Ceratina dupla.*

*__A. (Allocryptus) hyslopi__ Viereck (new subgenus, new species).

In Schmiedeknecht's classification of the Cryptinæ this subgenus will replace *Cryptopteryx* Ashmead, the latter genus being misplaced as it is related to *Zonocryptus* Ashmead.

Type locality: Stonington, 10 August, 1906 (J. A. Hyslop).

°**A. (Hoplocryptus) extrematis** Cresson. Howard, Insect Book, Pl. x, Fig. 4.

Parasite of the Cecropia moth and American tent-caterpillar.

°**A. nuncius** Say. Howard, Insect Book, Pl. x, Fig. 9.

°**A.** sp.

Host: *Papilio troilus.*

Phygadeuon Gravenhorst.

Key to Species.

1. Females 2
Males: thorax black 11
2. Thorax mostly reddish or black; abdomen, at least above, entirely or more or less reddish 3
Thorax and abdomen, the latter above, mostly black or blackish; scutel black; legs, including coxæ, reddish............ 8

3. Scutel not black 4

Scutel black 5

4. Scutel yellowish white; apex of abdomen black; head black, with white markings ....**planosæ**

Scutel yellowish stramineous; body mostly colored like scutel; antennæ with a whitish annulus ....**pallescens**

5. Antennæ black, or reddish or pale at base, and without a white annulus in middle 6

Antennæ not as described in preceding paragraph........... 9

6. Abdomen at base pale or red 7

Abdomen black at base and apex; exserted portion of ovipositor nearly as long as abdomen; areola triangular. Length 5.5-7 mm. ....**lucens**

7. Apex of abdomen black, without a white mark; face black.. 8

Apex of abdomen red or yellowish black; propodeum bispinose; antennæ mostly dark brown; first and second joints yellowish beneath; third joint pale brown beneath; palpi whitish; fore and mid coxæ brownish stramineous; hind coxæ mostly black, with a brownish stramineous tip; trochanters brownish and yellowish; fore femora brownish stramineous or fuscous, fore and mid tibiæ and their tarsi mostly yellow; hind tibiæ brownish stramineous to blackish brown, their tarsi blackish brown. Length 7-8 mm. ....**texanus**

8. Propodeum bispinose, otherwise mostly as in description of *texanus* above ....**texanus**

Propodeum with lateral angles instead of spines; antennæ rufous beneath, brownish above; legs reddish stramineous except fore and mid tarsi, which are brownish stramineous, tips of hind femora and tibiæ, which are blackish, and hind tarsi, which are mostly blackish. Length 5-8 mm. ....**ruficornis**

9. Antennæ brownish stramineous at base, and with a yellowish annulus; legs brownish stramineous; abdomen reddish brown; length 6-7 mm.; sheaths of ovipositor about half as long as abdomen ....**vulgaris**

Antennæ as described above for *vulgaris;* legs and abdomen reddish; length 4-7 mm.; sheaths of ovipositor less than half as long as abdomen ....**crassipes**

10. Exserted portion of ovipositor about as long as abdomen; antennæ with a pale annulus. Length 8-10 mm. ......**signatus**

Exserted portion of ovipositor hardly one-third as long as abdomen; abdomen above very dark brown or blackish ,except apex of second dorsal segment, which is reddish brown; basal half of antennæ brownish stramineous, apical half dark brown. Length 4.5 mm. ....**quintilis**

11. Abdomen not entirely stramineous above 12
Abdomen entirely stramineous above; antennæ not annulated **pallescens**

12. Abdomen above more or less red or brownish stramineous, black or blackish at apex 14
Abdomen above not colored as in species described in preceding paragraph 13

13. All of first dorsal abdominal segments black; dorsal segments beyond fifth very dark brown; coxæ in color nearly as in *tumidiformis*, basal half of hind pair mostly dusky; scape and pedicel brownish stramineous; areolet open. Length 6-7 mm. ....**nortoni**
Most of first dorsal abdominal segment black; dorsal segments beyond fourth very dark brown; coxæ brown of various shades, mid and hind pairs partly dusky; body about as long as in *nortoni* ....**tumidiformis**

14. Face mostly black, and with white orbital lines that are more or less dilated at clypeus........................ 15
Face black or mostly so, not maculated.................... 16

15. All coxæ black, trochanters reddish; margin of apical dorsal segment not partly whitish. Length 7 mm. ....**orbitalis**
Coxæ black, except for a yellowish tip to fore pair; fore and mid trochanters mostly yellowish; hind trochanters with proximal one mostly blackish, distal one mostly reddish. Length 6 mm. ....**orbitaliformis**

16. Abdomen with each dorsal segment partly black........... 17
Abdomen reddish above, or with at least several segments entirely red, or red with dark stains..................... 18

17. Abdomen above mostly black; second, third, and fourth dorsal segments with a complete brownish border; fifth and following segments more or less distinctly brown, at least along apical margin; coxæ and trochanters mostly black or blackish, rest of legs mostly reddish, clypeus and mandibles mostly yellow. Length 5.5 mm. ....**tæniatus**
Abdomen with apical margin on second dorsal segment and most of third and fourth segments brownish stramineous; fore and mid legs including coxæ almost entirely brownish stramineous; hind coxæ black, rest of hind legs reddish, except their trochanters, which are more or less fuscous; antennæ black throughout. Length 4 mm...... **melanocerus**

18. Fore coxæ yellow beneath, mid coxæ with a yellow tip, hind coxæ reddish, all trochanters mostly yellow. Length 5-6 mm. ....**brittoni**
All coxæ mostly stramineous, same as trochanters in color; most of fore and mid legs stramineous; hind legs beyond trochanters partly or mostly dusky; antennæ mostly brown

or brownish stramineous, brownish stramineous at base; each side of posterior aspect of propodeum with an ear-like projection. Length 4.5 mm. ....auriculiferus

P. **ruficornis** Provancher.

Colebrook, 27 July, 1905 (H. L. V.).

P. **vulgaris** Cresson.

New Haven, 4 July, 1905 (H. L. V.).

P. **lucens** Provancher.

P. **crassipes** Provancher.

°P. **signatus** Provancher.

Antennæ without a pale annulus in the male; length 8-10 mm.

°P. **planosæ** Fitch.

Length 7.5 mm.; mostly black; thorax partly red; abdomen and legs tawny red; hind tarsi and a band on the middle of the antennæ white.

Parasite on the larch cheater (*Planosa laricis*).

°P. **texanus** Cresson.

*P. (**Bachia?**) **tumidiformis** Viereck (new species).

Type locality: Connecticut. Possibly Farmington (Norton).

Type in collection of American Entomological Society, Philadelphia.

*P. (**B.?**) **brittoni** Viereck (new species).

Type locality: Stafford, 24 August, 1905 (W. E. B.).

*P. (**B.?**) **auriculiferus** Viereck (new species).

Type locality: Putnam, 12 July, 1905 (H. L. V.).

*P. (**Plesignathus**) **nortoni** Viereck (new species).

Type locality: Connecticut. Possibly Farmington (E. N.).

Type in collection of American Entomological Society, Philadelphia.

*P. (**P.**) **quintilis** Viereck (new species).

Type locality: New Haven, 4 July, 1905 (H. L. V.).

*P. (**P.**) **melanocerus** Viereck (new species).

Type locality: North Haven, 3 August, 1905 (H. L. V.).

*P. (**P.**) **tæniatus** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.).

*P. (**Scinacopus?**) **orbitaliformis** Viereck (new species).

Type locality: New Haven, 27 July, 1904 (P. L. B.).

°P. **orbitalis** Cresson.

P. (Polytribax) pallescens Viereck.

A Norton specimen, possibly from Farmington, is in the collection of the American Entomological Society, Philadelphia.

Hemiteles Gravenhorst.

The species of this group are said to be exclusively hyper- or secondary parasites.

Key to Species.

1. Clypeus with two teeth or tubercles on anterior edge........ 2
   Clypeus without teeth or tubercles on anterior edge........ 3
2. Abdomen blackish, with apical margins of dorsal segments pale; palpi nearly white; legs including coxæ reddish, except a black band at tip of hind femora and at tip of hind tibiæ, and hind tarsi, which are blackish except at base of first joint ....pimplæ
   Abdomen reddish, male with abdomen black at tip. Length 7 mm. ....meteori
3. Wings with blackish bands 4
   Wings not banded, but hyaline or dusky.................... 5
4. Propodeum not spined; antennæ 23-jointed; length 5 mm.; brownish or stramineous; apical abdominal segment black, as are two preceding segments; exserted portion of ovipositor one-fifth as long as body ..areator subspecies tenellus
   Propodeum spined; head, thorax, antennæ, and legs, dull reddish; abdomen brown, and with faint bands of yellow; sheaths of ovipositor about as long as abdomen. Length 7-8 mm. ....thyridopterygis
5. Wings hyaline; body not entirely black; abdominal segments without red or white bands; propodeum not spined........ 6
   Wings brownish 7
6. Abdomen mostly or entirely black 16
   Abdomen above mostly reddish brown with a blackish tinge; scape and pedicel stramineous, flagel blackish; legs pale stramineous, fore coxæ yellowish white ....lycænæ
7. Length less than 8 mm. 8
   Length 8 mm. (male); head and most of thorax black and with yellow marks; face below antennæ yellow, antennæ without an annulus, brown; propodeum, abdomen, and legs mostly reddish stramineous ....eximius
8. Length less than 6.5 mm. 9
   Length 6.5 mm.; head and thorax, including scutel, black; abdomen mostly reddish, first dorsal segment black except an apical reddish spot occupying its middle third, apical margin of fourth segment laterally blackish, following segments black above, those nearest the apex with

a pale apical edge; scape of antennæ black; second and sixth to ninth antennal joints stramineous; third, fourth and fifth joints brown, tenth and following joints blackish; legs mostly reddish; coxæ, trochanters, tibiæ and tarsi of fore legs, tibiæ and tarsi of mid legs, stramineous; apex of hind femora, apex of hind tibiæ and base of latter dusky, hind tarsi brown; exserted portion of ovipositor two-thirds as long as abdomen .... **metacomet**

9. Length 5-6 mm. 10

Length less than 5 mm. 11

10. Male: head and thorax black; mandibles brownish in middle; palpi stramineous; antennæ blackish throughout; tegulæ brown, wings yellowish at extreme base; fore and mid legs mostly brownish stramineous; mid coxæ blackish at base; hind coxæ brownish above, but blackish at base and beneath; hind trochanters mostly brown; hind femora mostly reddish, the latter dusky at apex; hind tibiæ mostly reddish, dusky at base and apex, their tarsi dusky; abdomen mostly reddish; basal four-fifths of first dorsal segment black, most of its apical fifth reddish, fourth and following dorsal segments dusky or blackish .... **nigricaniformis**

Female and male: differing from *nigricaniformis* as follows: mandibles almost entirely black; palpi brownish; tegulæ and wing bases whitish; mid coxæ entirely brownish stramineous, hind legs brownish stramineous, except their tibiæ and tarsi, which are mostly blackish; fourth and fifth dorsal abdominal segments reddish in female; abdomen entirely black or blackish in male .... **columbiæ**

11. Length less than 4.5 mm. 12

Length 4.5 mm. (male); mandibles partly yellowish, antennæ dark brown except pedicel and scape, which are whitish beneath; mid coxæ entirely brownish stramineous, hind coxæ reddish, hind tibiæ stramineous, brownish at base and apex; abdomen above mostly blackish or black, apical margins of second, third and fourth segments more or less reddish stramineous, fifth and following segments brown; otherwise as in *nigricaniformis* as described above . **loniceræ**

12. Length 4 mm. 13

Length 2.5-3 mm. (male); head, thorax and abdomen, black; scape rather yellowish beneath, rest of antennæ mostly brown; mandibles mostly yellow, palpi pale; tubercles, tegulæ, fore and mid coxæ and all trochanters, yellow or yellowish; hind coxæ blackish at base and above; rest of legs about as in *algonquinus* as described below. Female antennæ partly flattened; hind coxæ brownish stramineous, abdomen partly reddish brown to brownish ....**fulvipes** race

13. Female 14
Male: tegulæ yellowish; scape, pedicel, and base of first joint of flagel beneath, brownish stramineous; trochanters mostly yellowish; hind legs with their coxæ, femora and tibiæ mostly stramineous, the latter dusky at base and apex; hind tarsi mostly dusky; abdomen with first dorsal segment mostly black, second dorsal segment mostly black, but with thyridia stramineous and apical edge reddish, third dorsal segment stramineous and more or less infuscated, fourth and following dorsal segments mostly black, and with an apical stramineous edge 15

14. Head and thorax, including scutel, black; first to fifth joints of antennæ pale brownish stramineous to pale brown; rest of antennæ blackish; hind femora and tibiæ, and abdomen mostly reddish, fore and mid legs stramineous to brownish stramineous, hind coxæ and hind tarsi brownish stramineous, hind tibiæ apically and their tarsi dusky; exserted portion of ovipositor nearly as long as hind tibiæ ......**orbiformis**
Head and most of thorax, including scutel, black; prothorax and mesopleuræ partly reddish; legs and antennæ much the same in color as in *orbiformis* as described above; basal three-fourths of first dorsal abdominal segment blackish, second and third dorsal segments with an apical dusky margin, fourth and following dorsal abdominal segments entirely or nearly entirely black or blackish; exserted portion of ovipositor about as long as abdomen...**cressoniformis**

15. Clypeus produced in middle of anterior edge, but without a fossa on each side of depression; fourth dorsal abdominal segment not aciculate all over ....**laticinctus**
Clypeus produced in middle of anterior edge and with a fossa on each side of the depression; fourth dorsal abdominal segment aciculate all over ....**algonquinus**

16. Abdomen entirely black above ....**thyridopterygis**
Abdomen black above excepting the third segment which is mostly brownish; scape and pedicel whitish beneath, flagel various shades of brown; legs mostly stramineous to brownish stramineous, fore and mid coxæ and trochanters partly or entirely whitish ....**crassiformis**

H. (Orthizema?) areator subspecies tenellus (Say). *H. utilis* Norton. Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 4.

Bred from parasites of *Papilio thoas* and *Anisota senatoria.* New Haven (S. I. Smith).

***H. eximius** (Cresson). *Mesoleptus eximius* Cresson.

°**H. (Allocota) thyridopterygis** Riley. Howard, Insect Book, Pl. viii, Fig. 37.

Bred from the bag-worm (*Thyridopteryx ephemeræformis*) and the white-marked tussock-moth (*Hemerocampa leucostigma*). Hosts: *Scambus inquisitoriellus* Dalla Torre and *S. conquisitor* Say.

***H. (Zamicrotoridea) orbiformis** Viereck (new subgenus, new species.)

Differs from *Microtoridea* Viereck in the notauli and sternauli being absent beyond the middle.

Type locality: Branford, 20 July, 1905 (H. W. W.); also from New Haven, 4 July, 1905 (H. L. V.).

***H. (Eriplanus) metacomet** Viereck (new species).

Type locality: West Haven, 27 June, 1905 (H. L. V.).

***H. (Zoophthorus) nigricaniformis** Viereck (new species).

Type locality: New Haven, 24 May, 1905 (W. E. B.).

***H. (Idemum) crassiformis** Viereck (new species).

Type locality: Colebrook, 21 July, 1905 (H. L. V.).

***H. (Ethelurgus) loniceræ** Viereck (new species).

Type locality: New Haven, 7 May, 1904, on flowers of honeysuckle (*Lonicera fragrantissima*).

***H. (Rhadinocera) algonquinus** Viereck (new species).

Type locality: Putnam, 12 July, 1905 (H. L. V.).

***H. (Otacustes) cressoniformis** Viereck.

Type locality: West Haven, 27 June, 1905 (H. L. V.).

***H. (Astomaspis) fulvipes** Gravenhorst (race).

New Haven, 7 May, 1904 (H. L. V.), on gooseberry flowers (*Ribes oxyacanthoides*).

H. lycænæ Howard.

Reared from a parasite on the larva of (*Lycæna*) *Cyaniris pseudargiola.*

°**H. (Bathythrix) pimplæ** Howard.

Host: *Scambus inquisitoriellus* Dalla Torre.

°**H. (B.) meteori** Howard.

Host: *Meteorus communis* Cresson.

°**H. (Adiastola) columbiæ** Viereck. *Adiastola americana* Howard.

Host: *Scambus inquisitoriellus* Dalla Torre.

***H. laticinctus** Ashmead.

Type locality:. New Haven, June, 1880, reared from a parasite of (*Leucania, Heliophila*) *Cirphis unipuncta.*

Stilpnus Gravenhorst.

S. americanus Cresson.

Length 4-4.5 mm.; mostly black; antennæ brown; legs brownish stramineous; coxæ, except hind pair, more or less brownish to brownish stramineous, hind pair mostly blackish, partly dark brown.

New Haven, 20 June, 1905 (W. E. B.).

Phæogenes Wesmael.

Key to Species.

1. Head and thorax mostly black; abdomen more or less reddish 2
   Mostly or entirely reddish 4
2. Abdomen black at apex; antennæ with a pale annulus........ 3
   Abdomen entirely reddish, at least above; clypeus, antennæ and legs mostly pale reddish; mandibles and tegulæ yellow; wings subhyaline, hind tibiæ and hind tarsi dusky. Length 9-10 mm. ....**fungor**
3. Length 9-10 mm.; mostly black; legs, except tips of hind femora and tips of hind tibiæ, and abdomen, except ultimate, penultimate and antipenultimate segments, reddish; flagel with a white annulus and with its first, second and third joints reddish; wings faintly dusky; hind coxæ toothed near apex; male with antennæ black, except for a white annulus on flagel; femora and hind tibiæ black ....**hebrus**
   Length 4.7-6.2 mm.; mostly black; mandibles except tips and base of flagel, yellowish, latter with a whitish annulus; tegulæ whitish; legs, except knees of hind pair and tips of hind tarsi, yellowish red, as are second, third and fourth dorsal abdominal segments; wings hyaline; hind coxæ toothed at apex ....**hebe**
4. Head mostly or entirely reddish 5
   Head, apex of abdomen, hind femora and hind tibiæ, black; wings subhyaline. Length 10 mm. ....**quadriceps**
5. Ultimate, penultimate and antipenultimate abdominal segments black, at least above; antennæ in some individuals more or less black above and at tip, and with a whitish annulus on the flagel; wings hyaline. Length 6.7 mm.....
   vincibilis
   Apical ventral abdominal segment blackish at tip, as are antennæ at their tips; antennæ pale at base, with a pale an-

nulus at about their middle; wings hyaline; hind coxæ toothed beneath. Length of body 7.5 mm. ....helvolus

***P. fungor** Norton.

The records for this species in the Agricultural Experiment Station in New Haven indicate that it occurs throughout the state in June, July and August (W. E. B., B. H. W., H. W. W., J. A. Hyslop, E. J. S. M.).

***P. hebe** Cresson.

***P. hebrus** Cresson.

***P. (Centeterus) quadriceps** Cresson.

***P. helvolus** Cresson.

P. vincibilis Cresson.

West Haven, 27 June, 1905 (H. L. V.); Branford, 27 June, 1905 (H. W. W.).

Eparces (Foerster) Ashmead.

°**E. tuberculifrons** (Provancher).

Length 6.2-7.5 mm.; mostly reddish; tips of antennæ and apex of abdomen more or less black, former with a whitish annulus at about their middle; wings clouded with fuscous.

Colpognathus Wesmael.

***C. helvus** Cresson.

Length 7.2-10 mm.; mostly reddish; mandibles black, apex of antennæ also black; wings subhyaline.

Eurylabus Wesmael.

°**E. agilis** Cresson.

Length 8-8.7 mm. Female: mostly black, a dot on each side of vertex, annulus on flagel, dot beneath tegulæ on pleuræ, scutel and postscutel, white; wings hyaline, fore and mid tibiæ and tarsi more or less pale. Male: with sides of face, two spots on clypeus, labial palpi, spot on scape beneath, spot on tegulæ, and a line before tegulæ, white; extreme base of femora reddish; otherwise as in female.

Platylabus Wesmael.

Key to Species.

Scutel of female reddish; antennæ of male with a white annulus; head, anterior half of thorax and apical third

of abdomen, mostly black; antennæ mostly brown; most of remaining integument reddish; some of segments of basal third of abdomen with an apical yellowish or whitish band. Length 6-8 mm. .... **thoracicus**

Scutel of female white; antennæ of male without a white annulus; mostly metallic blue. Length 12-13 mm. ...... **clarus**

°**P. (Apæleticus) thoracicus** Cresson.

P. clarus Cresson.

Trogus Gravenhorst.

Key to Species.

1. Species mostly black; antennæ orange, with a fuscous or nearly fuscous tip 2

   Species mostly reddish .... **vulpinus**

2. Petiole produced above so as to appear rather pyramidal, and without a median longitudinal channel .... **brullei**

   Petiole simply rather convex above, and with a shallow median longitudinal channel .... **obsidianator**

T. (Psilomastix) vulpinus Gravenhorst. *T. exesorius* Brullé. Pl. ix, Fig. 8.

Parasite of swallow-tail butterflies (*Papilio*). New Haven, 20 June, 1902 (E. J. S. M.), 3 August, 1896 (W. C. Sturgis), 26 August, 1902 (B. H. W.); Westville, 2 June, 1901 (W. E. B.).

***T. (Automalus) brullei** Cresson.

Hosts: larvæ of *Dolba hylæus* and *Smerinthus astylus.* Woodbridge, 26 August, 1906, Stafford, 24 August, 1905 (W. E. B.).

°**T. obsidianator** Brullé.

Parasitic on *Papilio polyxenes.*

Hoplismenus Gravenhorst.

H. morulus Say. Howard, Insect Book, Pl. x, Fig. 29; Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 9.

Length 16 mm.; conspicuous on account of being almost entirely black; tibiæ and tarsi yellowish stramineous; fore coxæ with a yellow mark in front; scape in male anteriorly more or less yellow, face beneath antennæ in male yellow; female antennæ with a yellow annulus; wings fuscous.

The hosts of this American species are the cosmopolitan mourning-cloak butterfly [(*Vanessa*) *Euvanessa antiopa*], and the question-sign butterfly [(*Grapta*) *Polygonia interrogationis*].

Amblyteles Wesmael.

Ichneumon Authors, not Linnæus.

In the writer's opinion *Pterocormus** should rank as a subgenus of *Amblyteles*, which is one of the largest of genera. It is probably one of the most useful groups of insects on account of the habit of some of its species of parasitizing, and thus destroying, injurious insects.

Key to Species.

Females.

1. Species of *Pterocormus* 2
Species of *Amblyteles* in the strict sense; propodeum without lateral spines 56
2. Abdomen, at least above, mostly black or blue, without pale bands or spots, except in some species or individuals, which have apex of first or last dorsal segment pale-banded or spotted 3
Abdomen not colored as in preceding paragraph............ 25
3. Hind legs entirely or nearly entirely black, their tibiæ immaculate 4
Hind legs not colored as in preceding paragraph............ 19
4. Hind coxæ with a densely hairy area beneath 5
Hind coxæ without a densely hairy area beneath............ 11
5. Apex of abdomen immaculate 6
Apex of abdomen with one or more white spots; hind trochanters white. Length 9.5-12 mm. ....**extrematatis**
6. Wings fuliginous 7
Wings hyaline; scutel white and black 10
7. Hairy area of under side of hind coxæ condensed, like velvet 8
Hairy area of under side of hind coxæ not condensed....... 9
8. Postpetiole scabrous. Length 12.5-14 mm. ....**cincticornis**
Postpetiole punctate above; hairy area of under side of hind coxæ brown and equal in extent to apical end of pedicel in this species; length 14 mm.; mostly black; eighth to sixteenth joints inclusive partly yellow; pear-shaped welts along superior margin of mesopleuræ and disk of scutel, yellow ....**nigratoricolor**
9. Postpetiole finely scratched above. Length 16 mm ...**germanus**
Postpetiole punctate above. Length 14-16 mm. ....**viola**
10. Abdomen, at least above, steel-blue. Length 11-17 mm. **cæruleus**
Abdomen, at least above, black, tinged with blue; length 16 mm.; more than half of margins of face and cheeks, bordering on eyes, luteous; mandibles and palpi immac-

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* *Pterocormus* Foerster in the strict sense supplants *Ichneumon* Authors, not Linnæus.

ulate; scape entirely black; pale marks of thorax luteous; propodeum rather smooth, but deeply punctate; areola smooth and shining, rather indistinctly sculptured and hexagonal, the carinæ forming its boundary not sharp; areola about as long as wide at apex; its base separated from scutel by a groove that is seemingly not as wide antero-posteriorly as scape is thick; areolet pentagonal, its radial side a little shorter than either of its cubital sides and approximately half as long as either transverse cubitus; legs black with the exception of fore tibiæ, which are pale in front ....**pequoitorum**

11. Apex of abdomen immaculate 12
Apex of abdomen with one or more pale spots; scutel white, penultimate dorsal abdominal segment also with a pale spot; face without pale orbital lines; pronotum above, line in front of tegulæ, and a line beneath tegulæ, white; wings hyaline or nearly hyaline. Length 9-12.5 mm. ....**brevicinctor**

12. Wings fuliginous 13
Wings hyaline 18

13. Scutel more or less white 14
Scutel black 15

14. Head not buccate. Length 14 mm. ....**caliginosus**
Head buccate. Length 19 mm. ....**orpheus var.**

15. Head subquadrate; posterior angles of propodeum rounded.. 16
Head not subquadrate; posterior angles of propodeum spiniform; abdomen, at least above, black; depressions at base of second dorsal segment shallow. Length 12.5-15 mm. **malacus**

16. Pale orbital lines distinct in front above antennæ; depressions at base of second dorsal abdominal segment with their greatest length equal to one-third the basal width of the segment. Length 19 mm. ....**orpheus**
Face entirely black; depressions at base of second dorsal abdominal segment with their greatest length equal to one-fourth the basal width of the segment. Length 15 mm. .. **saucius**

17. Scutel more or less white; postpetiole above broadly dilated; gastrocœli moderately deep 18
Scutel black; abdomen, at least above, black, though sometimes faintly tinged with blue; postpetiole punctate above. Length 12.5 mm. ....**apertus**

18. Anterior orbits indistinctly pale. Length 9-15 mm.....**subcyaneus**
Anterior orbits very distinctly pale ....**cinctitarsis**

19. Hind legs mostly black or blue............................ 20
Hind legs mostly or entirely reddish; apex of abdomen more or less white. Length 6-9 mm. ....**helvipes**

20. Only tibiæ of hind legs marked with white or yellow...... 21

Hind coxæ, femora and tibiæ marked or banded with white; abdomen, at least above, steel-blue. Length 16 mm...**pulcher**

21. Propodeum black 22

Propodeum brownish red. Length 17.5 mm. ....**centrator**

22. Hind coxæ beneath with a velvety area; apex of abdomen spotless 23

Hind coxæ beneath without a velvety area; apex of abdomen spotless; scutel pale 24

23. Scutel mostly black; white only at its sides. Length 10-11 mm. ....**navus**

Scutel mostly white; nearly all of under surface of hind coxæ velvety; hind tibiæ with a white line behind near their base. Length 11-14 mm. ....**sagus**

24. Propodeum with a white spot on each side. Length 12.5-16 mm. ....**otiosus**

Propodeum immaculate; body as long as in otiosus.......... **unifasciatorius**

25. Abdomen above mostly black, but marked with white or yellow spots or bands, and sometimes varied with reddish maculations 26

Abdomen above not answering description in preceding paragraph 28

26. Species not answering description in following parapraph.. 27

Dorsum of abdomen with second and often third segment with an apical yellowish band, apical and adjoining segments reddish; mesothorax and generally propodeum also reddish, femora black. Length 14 mm. ....**subdolus**

27. Dorsum of abdomen with second segment fulvous, and with a whitish band at apex of third, fourth and sixth segments; legs fulvous or reddish. Length 11-14 mm. ..**jucundus**

Dorsum of abdomen with second segment fulvous and all its segments with an apical yellow band; face black; hind coxæ beneath not at all velvety. Length 12.5-14 mm. **atrifrons**

28. Abdomen above mostly reddish, with its apex, however, black; hind coxæ beneath not at all velvety; scutel whitish or reddish 29

Abdomen above mostly reddish or fulvous, first segment and base or apex of second and sometimes third and fourth segments, more or less black 35

29. Joints of basal portion of flagel elongate, oblong in profile.. 30

Joints of basal portion of flagel not elongate, subquadrate in profile; abdomen above with first, second, third, and sometimes fourth segments entirely reddish; hind femora and tibiæ marked with black; apex of abdomen, at least above, black. Length 7.5 mm. ....**hospitus**

30. Thorax entirely or partly black 31
Thorax entirely reddish; third antennal joint scarcely longer than fourth; apex of abdomen with a pale spot. Length 9 mm. .... **putus**

31. Antennæ with a distinct pale annulus 32
Antennæ without a distinct annulus 34

32. Apex of abdomen dusky or black, without pale spots; second dorsal segment reddish. Length 12.5 mm. 33
Apex of abdomen with pale spots; mesonotum and a large mark on mesopleuræ reddish. Length 7.5 mm. ....**terminalis**

33. Areola and petiolarea not confluent, but separated by a raised line .... **instabilis**
Areola and petiolarea confluent, not separated by a raised line; head black; first to fifth joints of flagel brownish, sixth to eleventh yellowish, rest dark brown; propodeum black; coxæ and most of trochanters black; fore tibiæ mostly brownish; mid tibiæ mostly black, hind tibiæ black except for a brownish base; most tarsi uniformly brownish **winkleyi**

34. Second dorsal abdominal segment with black stains; length of body 9.5 mm.; apical half of antennæ blackish, lower half merging in color from reddish to brownish to yellowish; head almost entirely dark reddish; pronotum, a line beneath insertion of wings, and dorsulum, reddish; scutel reddish with a yellowish tinge; legs reddish except coxæ, which are black, proximate trochanters, apical half of hind femora, and apical fourth of hind tibiæ, which are mostly blackish; second dorsal abdominal segment with blackish stains **brittoni**
Second dorsal abdominal segment reddish throughout. Length 12.5 mm. .... **instabilis** var.

35. Wings fuliginous 36
Wings hyaline or subhyaline.............................. 40

36. Hind coxæ without a distinct velvety area or not at all velvety beneath 37
Hind coxæ with a distinct velvety area beneath; thorax black. Length 17-25 mm. .... **grandis**

37. Thorax black 38
Thorax more or less reddish; hind legs, except coxæ, entirely reddish; head reddish; second dorsal abdominal segment in some individuals black at base. Length 14 mm. ....**lewisi**

38. Hind legs mostly, but not entirely, black 39
Hind legs entirely black. Length 12.5-17.5 mm. ......**rufiventris**

39. Hind tibiæ white at base. Length 14-20 mm. ....**devinctor**
Hind femora reddish. Length 14-16 mm. ....**insolens**

40. Thorax mostly black 41
Thorax mostly reddish 52

41. Thorax almost entirely black; scutel white or yellow....... 42
Thorax not almost entirely black 44
42. Apex of abdomen with a pale spot 43
Apex of abdomen without a pale spot; abdomen above, except base of first segment, entirely reddish. Length 9-12 mm. ....**lætus**
43. Hind coxæ reddish. Length 7.5-10 mm. ....**velox**
Hind coxæ black; thorax partly reddish. Length 9 mm.....**maius**
44. Mesothorax and sometimes propodeum, more or less reddish 45
Propodeum with more or less whitish or yellowish marks. Length 14-17.5 mm. ....**w-album**
45. Hind tibiæ without a pale annulus 46
Hind tibiæ with a pale annulus 50
46. Hind tibiæ reddish, except their tips, which are black...... 47
Hind legs, except sometimes coxæ, reddish; antennæ with a pale annulus; scutel yellow 51
47. Antennæ with a distinct pale annulus 48
Antennæ without a distinct pale annulus................. 49
48. Areola and petiolarea not confluent, but separated by a raised line. Length 12.5 mm. ....**instabilis**
Areola and petiolarea confluent, not separated by a raised line; length 12.5 mm.; see also description under 33..**winkleyi**
49. Second dorsal abdominal segment with black or blackish stains; length 9.5 mm.; see also description under 34 ..**brittoni**
Second dorsal abdominal segment reddish throughout. Length 12.5 mm. ....**instabilis var.**
50. Length 5-7.5 mm. ....**annulipes**
Length 10 mm. ....**signatipes**
51. Abdomen above with first to fourth segments more or less black at base. Length 11 mm. ....**seminiger**
Abdomen above with first to fourth segments concolorous with propodeum, which is pale reddish or bright reddish. Length 12 mm. or more ....**confirmatus**
52. Apex of abdomen without a pale spot.................... 53
Apex of abdomen with a pale spot, second and third dorsal abdominal segments each with a large black mark. Length 10 mm. ....**disparilis**
53. Abdomen above entirely reddish 54
Abdomen above not entirely reddish, but mostly so, second to fourth segments black or blackish at base. Length 11 mm. or more ....**brevipennis**
54. Propodeum without prominent lateral tubercles; postpetiole punctate above, anterior margin of clypeus truncate. Length 7.5 mm. ....**soror**
Propodeum without prominent tubercles, postpetiole either smooth or indistinctly scratched; second dorsal segment

closely and finely punctate; thorax partly dusky; hind tibiæ pale at base, fuscous at apex; antennæ with a pale annulus. Length 6 mm. .... **nanus**

55. Abdomen blue, at least above 56
Abdomen black and reddish, at least above............... 57

56. Hind legs blue, immaculate; scutel with only about six distinct punctures; apex of abdomen immaculate; length 15 mm.; flagel blackish, except seventh to thirteenth joints, which are mostly yellowish brown; face rather umbilicately punctate; greatest dimension of spaces between punctures, on dorsulum, equal to three or four puncture widths; basal area, areola and petiolarea confluent, these, together with external area, apparently impunctate, and seemingly finely striate; punctures on rest of body about as far apart as those on dorsulum; radial side of areolet less than one-half as long as shortest side of areolet ..**sassacus**
Hind legs reddish, except tips of tibiæ and tarsi, which are black; abdomen fusiform. Length 14 mm. ....**ormenus**

57. Apex of abdomen black 58
Apex of abdomen reddish 59

58. Scutel black, mid and hind legs black or blackish throughout. Length 14 mm. ....**rufizonatus**
Scutel pale; hind legs black; bases of tibiæ reddish; antennæ with joints of basal portion oblong in profile; second, third and fourth dorsal abdominal segments and apex of first, reddish; segments at apex of abdomen with a pale spot. Length 11 mm. ....**nortoni**

59. Head and thorax more or less reddish 60
Head and thorax black; hind legs entirely black; postpetiole scratched above; third joint of antennæ much longer than fourth. Length 12.5-15 mm. ....**detritus**

60. Abdomen fusiform, its dorsal segments generally more or less black at base; basal portion of flagel with its joints scarcely twice as long as broad, except first joint, which is three times as long as broad; thorax generally mostly reddish, and with black sutures; length 11-14 mm.; antennæ with more or less of a yellow annulus ....**suturalis**
Abdomen subcompressed at tip; antennæ with a pale annulus. Length 14 mm. ....**anceps**

Males.

1. Second and fourth ventral abdominal segments with a longitudinal median ridge or fold; propodeum rarely bispinose, scutel more or less flat, or simply convex, then gradually sloping to apex 2

Third, fourth and eighth ventral abdominal segments flat, smooth, without a longitudinal median ridge or fold; scutel flat or simply convex 61

2. Abdomen mostly black or blue 3

Abdomen mostly yellow or reddish 43

3. Abdomen black or blue, without pale bands or spots, except sometimes on apex of first or apical segment 4

Abdomen black and yellow, sometimes partly reddish 28

4. Hind legs not entirely black 5

Hind legs entirely black 21

5. Hind legs not reddish 6

Hind legs mostly reddish, their coxæ black; apical abdominal segment white; face black, narrowly pale laterally; scutel whitish apically ....**helvipes**

6. Hind tibiæ, only, more or less white 7

Hind coxæ, hind femora and hind tibiæ more or less white; scutel white only laterally; abdomen blue; propodeum with white maculations ....**pulcher**

7. Antennæ black, except for a pale annulus; abdomen immaculate at apex 8

Antennæ entirely black 12

8. Postpetiole with a white mark or band at tip 9

Postpetiole entirely black 10

9. Propodeum immaculate ....**unifasciatorius**

Propodeum with two white maculæ posteriorly ....**sublatus** var.

10. Hind tibiæ without an entire white annulus, but with a white line above, toward base 11

Hind tibiæ with an entire white annulus at base; apex of abdomen immaculate, petiole above entirely black; hind trochanters white, scutel white laterally. Length 10-11 mm. ....**navus**

11. Propodeum immaculate; annulus on antennæ complete. Length 11-14 mm. ....**sagus**

Propodeum with a white spot on each side of the middle; annulus on antennæ interrupted beneath. Length 12.5-14 mm. ....**sublatus** var. **proximus**

12. Postpetiole entirely black; scutel pale; apex of abdomen black 13

Postpetiole with a white spot or band at apex 19

13. Propodeum immaculate 14

Propodeum with two white spots behind. Length 12.5-14 mm. ....**sublatus**

14. Hind tibiæ white or yellow, black at tips 15

Hind tibiæ black, with a white line above; face white laterally, black down the middle 17

15. Wings subhyaline 16

Wings fuscous. Length 16 mm. ....**bronteus**

16. Hind tarsi with at least first and second joints yellowish or whitish, with fuscous tips; fore and mid coxæ yellow, hind coxæ black .... **cinctitarsis**
Hind tarsi entirely black, all coxæ white. Length 15-17.5 mm. **ultus**
17. Postpetiole coarsely scratched above 18
Postpetiole smooth or only punctate above; wings subhyaline; the white line on hind tibiæ not reaching to the tip. Length 9-15 mm. .... **subcyaneus**
18. Abdomen black above, second segment uniformly sculptured; hind coxæ with white maculations. Length 15-17.5 mm.... **ultus var. rogalis**
Abdomen bluish black above, second segment coarsely and longitudinally rugose on the basal half; hind coxæ entirely black. Length 14-15 mm. .... **stadaconensis**
19. Scutel white 20
Scutel white only along lateral margins; abdomen blue, at least above. Length 11-17.5 mm. .... **cæruleus**
20. Abdomen black, at least above; propodeum with a white spot on each side. Length 15 mm. .... **infidelis**
Abdomen black, at least above; propodeum immaculate. Length 14-16 mm. .... **azotus**
21. Antennæ mostly black and blue or entirely black 22
Antennæ mostly orange-yellow, black at extreme base and apex. Length 17.5 mm. .... **flavicornis**
22. Antennæ mostly black, and with a pale annulus............ 23
Antennæ entirely black or blue; face mostly white and with a black median longitudinal stripe; scutel white, as are fore and mid coxæ. Length 19-20 mm. .... **pepticus**
23. Apex of abdomen immaculate; wings dark fuliginous 24
Apex of abdomen with one or more pale spots 26
24. Postpetiole entirely black 25
Postpetiole more or less white at tip; face white, except in some individuals in which the lateral depressions are black. Length 12.5-16 mm. .... **unifasciatorius**
25. Face entirely black. Length 15-17 mm. .... **galenus**
Face black and white; scutel black and white. Length 16 mm. .... **? pequoitorum**
26. Postpetiole entirely black above 27
Postpetiole with a narrow (antero-posterior) apical margin of white above; propodeum with a white spot on each side. Length 13 mm. .... **merus**
27. Hind trochanters black. Length 9-12.5 mm. .... **brevicinctor**
Hind trochanters white. Length 9.5-12.5 mm. ...... **extrematatis**
28. Apex of abdomen partly or entirely black or yellow........ 29
Apex of abdomen partly or entirely fulvous 41

29. Apex of abdomen entirely black or blackish brown or yellow; antennæ without a pale annulus 30

Apex of abdomen mostly black, margined with white or yellow 39

30. Second and third dorsal abdominal segments yellow and black 31

Second and third dorsal abdominal segments yellow at base or apex and sometimes centrally fuscous or reddish. Length 11-14 mm. ....**versabilis**

31. Second and third dorsal abdominal segments more or less black at apex 32

Second and third dorsal abdominal segments more or less black at base, apex of abdomen black 35

32. Fourth dorsal abdominal segment not partly yellow........ 33

Fourth dorsal abdominal segment partly yellow............ 34

33. Abdomen dull, postpetiole scratched, gastrocœli transverse; propodeum generally more or less yellow. Length 15-16 mm. ....**comes**

Abdomen shining, postpetiole smooth and polished, gastrocœli linear; entirely black. Length 10-12.5 mm. ....**wilsoni**

34. Abdomen otherwise as in *comes* or nearly so; body as long as in *comes* ....**comes** var. **aleatorius**

Apex of abdomen black, gastrocœli deep, first dorsal segment entirely black. Length as in *comes* ....**comes** var.

35. Length less than 15 mm. 36

Length 15 mm. or more 37

36. Length 9 mm. ....**parvus**

Length 6-7 mm.; pale orbital lines interrupted posteriorly.. **parvus** var.

37. Length 17 mm.; color nearly as in *comptus*, but abdomen above mostly black, and with four conspicuous yellow transverse bands and with an indistinct fifth transverse yellow band; legs black and yellow ....**quadrizonatus**

Color not nearly as in *comptus* 38

38. Pale orbital lines interrupted posteriorly. Length 15-16 mm. **laetus**

Pale orbital lines not interrupted posteriorly, but entire. Length 16-19 mm. ....**munificus**

39. Mesothorax mostly black, maculated 40

Mesothorax entirely black; abdomen mostly black above and with yellow or whitish transverse bands. Length 14-16 mm. ....**flavizonatus**

40. Length 13 mm.; cheeks black, antennæ mostly black, scape and pedicel partly yellow; mesothorax mostly black, only a yellow line above and below insertion of wings; wings tinted with brown, veins mostly dark brown, stigma pale brown; hind coxæ entirely black; fore and mid legs al-

most entirely yellow, hind legs yellow with the exception of coxæ described above; apical three-fourths of hind femora and apical third of hind tibiæ black; greater part of apical half of first abdominal segment, dorsally and laterally, yellow; beyond first segment abdomen above mostly reddish, with a little more than basal third of second, and less than basal third of third to sixth segments, blackish; abdomen brownish yellow beneath; dorsulum may be entirely black, and pale portions of abdomen may be yellowish .... **footei**

Length 12.5-14 mm.; mesothorax black, except two longitudinal lines above; abdomen mostly yellow above and with black bands; legs yellow or stramineous .... **comptus**

41. Antennæ with a pale annulus; postpetiole above smooth and polished 42

Antennæ without a pale annulus; postpetiole punctate above. Length 11 mm. .... **mimicus**

42. Hind femora black. Length 7-10 mm. .... **paratus**

Hind femora fulvous. Length 10-11 mm. .... **vinnulus**

43. Abdomen mostly reddish above 44

Abdomen mostly yellow above, ultimate, penultimate and antepenultimate dorsal segments, and even one additional dorsal segment, black; legs entirely yellow. Length 16 mm. .... **milvus**

44. Apex of abdomen black or blackish, second to fourth dorsal abdominal segments more or less reddish; wings hyaline or subhyaline 45

Apex of abdomen not black or blackish 50

45. Antennæ without a pale annulus; scutel more or less pale ... 46

Antennæ with a pale annulus 48

46. Hind coxæ black and white, or black 47

Hind coxæ reddish. Length 6.5 mm. .... **citrifrons**

47. Postpetiole coarsely granulated above, not longitudinally rugose; hind coxæ black and white. Length 15 mm. ... **electus**

Postpetiole above finely scratched; scutel convex. Length 12.5 mm. .... **instabilis**

48. Segments of apical portion of abdomen entirely black 49

Segments of apical portion of abdomen with white maculæ. Length 7.5-9 mm. .... **finitimus**

49. Coxæ, trochanters and femora of hind legs, reddish. Length 7.5 mm. .... **hospitus**

Coxæ, trochanters and femora of hind legs black or nearly black; length 8 mm.; wings transparent, and with a brownish tinge .... **leviculus**

50. Wings dark fuliginous or black 51

Wings hyaline or subhyaline, sometimes reddish 55

51. Antennæ without a pale annulus; abdomen mostly reddish 52

Antennæ with a pale annulus; head and thorax black. Length 14-16 mm. .... **insolens**

52. Only first dorsal abdominal segment black 53
First to fourth dorsal abdominal segments more or less black at base; scutel yellow. Length 15-16 mm. ....**succinctus**

53. Hind legs entirely black 54
Hind legs only mostly black, their tibiæ with a white line or spot laterally toward base; scutel white; scape entirely black. Length 14-20 mm. ....**devinctor**

54. Head subquadrate; cheeks convex. Length 17-25 mm...**grandis**
Head subtriangular, cheeks flattened; scutel black; postpetiole scratched. Length 12.5-17.5 mm. ....**rufiventris**

55. Antennæ with a pale annulus 56
Antennæ without a pale annulus 61

56. Hind coxæ black, or black and white, or black and yellow; gastrocœli elongate, linear, subobsolete, or wanting 57
Hind coxæ reddish 60

57. Clypeus either concave or with a more or less distinct median impression or fovea 58
Clypeus flat or subconvex, not excavated medially; abdomen above fulvous, generally more or less marked with fuscous. Length 6-9 mm. ....**scitulus**

58. Clypeus with a more or less distinct median impression or fovea; abdomen above uniformly fulvous or reddish.... 59
Clypeus broadly concave; abdomen above mostly fulvous, and generally with fuscous spots on second to fourth segments. Length 14-17.5 mm. ....**w-album**

59. Length 11-13 mm.; hind femora not reddish ....**duplicatus**
Length 8-9 mm.; hind femora reddish ....**duplicatiformis**

60. All dorsal abdominal segments black and reddish; length 9 mm.; body, at least above, closely punctate; areola subquadrate, bounded anteriorly by a groove separating it from postscutel; face below insertion of antennæ and orbital margins, yellow; orbital yellow mark not completely bounding eyes; lateral margin of pronotum, a line beneath each wing, greater portion of scutel, fore coxæ, greater part of mid coxæ, fore trochanters and mid trochanters, yellow; spurs whitish; antennæ various shades of brown, and with a yellow annulus, owing to fifteenth to twenty-second joints being entirely or mostly yellow; scape brownish yellow; mesopleuræ and propodeum partly, hind coxæ almost entirely, trochanters, femora and part of tibiæ of hind legs, apical fourth of first abdominal segment, second and third dorsal abdominal segments, greater part of each succeeding segment, and abdomen beneath, except first segment, various shades of red; wings subhyaline, tinted with brown; veins dark brown, stigma pale brown **quintilis**

Dorsal abdominal segments second to fourth, sometimes including fifth, narrowly black at base. Length 14-15 mm. volens

61. Abdomen above entirely reddish; mesothorax reddish, rest of thorax mostly reddish, hind femora reddish; head black and yellow. Length 7.5-9 mm. .... utilis

Abdomen above mostly reddish; basal margin of segments more or less black; head and thorax reddish, except pleuræ which are generally black beneath; gastrocœli deep, foveiform; postpetiole scratched. Length 12.5-15 mm. .... longulus

62. Abdomen above black or blue, immaculate; legs black or blue and white; scutel pale; face more or less white 63

Abdomen above black and reddish; second, third, and sometimes base of fourth segment, more or less reddish; scutel pale, hind legs black; coxæ, tibiæ and tarsi varied with white. Length 15 mm. .... electus

63. Abdomen black, at least above. Length 15-17.5 mm. ...... ultus

Abdomen blue-black, at least above. Length 14-15 mm. stadaconensis

***A. (Chasmias?) pequoitorum** Viereck (new species).

Type locality: Putnam, 12 July, 1905 (H. L. V.).

°**A. (C.) orpheus** (Cresson).

°**A. (C.) saucius** (Cresson).

***A. (C.?) nigratoricolor** Viereck (new species).

Type locality: Branford, 19 September, 1904 (H. W. W.).

A. (Stenichneumon?) malacus (Say). Howard, Insect Book, Pl. ix, Fig. 16.

Occurs throughout the state. Branford, 19 July, 1905 (H. W. W.); North Branford, 16 November, 1912 (H. B. Kirk).

***A. (S.?) cinctitarsis** (Provancher).

A. (S.?) cincticornis (Cresson).

Occurs all over the state.

A. (S.?) flavicornis (Cresson).

On the wing in June and July, throughout the state.

A. (S.?) otiosus (Say).

Scotland, 15 July, 1904 (B. H. W.).

A. (S.?) ormenus (Cresson).

New Haven (A. E. V.).

A. (S.?) centrator (Say). Howard, Insect Book, Pl. ix, Fig. 14, as *Ichneumon curtator* (typographical error).

Parasitic on (*Pyrrharctia*) *Isia isabella*. Occurs in June and July, throughout the state.

A. (**Cratichneumon?) galenus** (Cresson).

This is probably the male of *cincticornis*.

Generally distributed in Connecticut.

A. (C.?) pepticus (Cresson).

This may be the male of *orpheus*. New Haven, 21 May, 1903 (W. E. B.).

A. (C.) subcyaneus (Cresson).

This species may be parasitic on the white-marked tussock moth, *Hemerocampa leucostigma*. Occurs throughout the state as early as May, during which month it visits flowers of *Forsythia*, and as late as September.

A. (C.?) comes (Cresson). Pl. ix, Fig. 2.

Visits flowers of *Cicuta maculata*. May be only a variety of *bronteus*. Generally distributed throughout the state, and has been taken, flying, June to October.

A. (C?) **comes** var. **aleatorius** (Harris).

(A. C.?) flavizonatus (Cresson). Howard. Insect Book, Pl. x, Fig. 11.

A parasite of the army worm, (*Leucania, Heliophila*) *Cirphis unipuncta*, and may be the male of *jucundus*. Generally distributed throughout the state. Has been taken, flying, in June.

A. (C.?) leviculus (Cresson).

Stafford, 24 August, 1904 (W. E. B.).

A. (C.?) succinctus (Brullé).

New Haven, 16 June, 1900 (W. E. B.).

A. (C.?) w-album (Cresson). Howard, Insect Book, Pl. x, Fig. 6. *Cœlichneumon*, according to Morley.

New Haven, 14 June, 1905 (B. H. W.), 22 August, 1904 (P. L. B.).

A. (C.?) **annulipes** (Cresson).

°**A. (Pterocormus?) germanus** (Cresson).

***A. (P.?) apertus** (Cresson).

A. (P.?) **merus** (Cresson).

New Haven, 8 June, 1904 (W. E. B.).

A. (Cratichneumon) **brevicinctor** (Say).

Westville, 11 June, 1905 (W. E. B.).

°A. (P.?) **caliginosus** (Cresson).

A. (Melanichneumon) **extrematatis** (Cresson).

Occurs all over the state, and has been taken in May and July.

A. (P.?) **sagus** (Cresson).

A. (Stenichneumon) **sublatus** (Cresson).

A. (S.) **sublatus** var. **proximus** (Cresson).

°A. (Cratichneumon) **azotus** (Cresson).

*A. (P.?) **infidelis** (Cresson).

Type locality: Connecticut (E. N.).

A. (Cratichneumon) **unifasciatorius** (Say). Howard, Insect Book, Pl. x, Fig. 10. *Cœlichneumon* according to Morley.

Parasitic on (*Acronycta*) *Apatela oblinita*. Genrally distributed over the state and on the wing in August and September.

*A. (P.?) **bronteus** (Cresson).

A. (Barichneumon) **helvipes** (Cresson).

A. (P.?) **versabilis** (Cresson). Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 2.

Hosts: (*Chrysophanus*) *Hoedes hypophlæas*, (*Grapta*) *Polygonia faunus*. Colebrook, 21 July, 1905 (H. L. V.), on flowers of *Cicuta maculata*.

°A. (P.?) **wilsoni** (Cresson). Howard, Insect Book, Pl. x, Fig. 1.

A. (P.?) **munificus** (Cresson).

A. (P.?) **mimicus** (Cresson).

Probably confined to the Alleghanian region of the state.

*A. (P.) **quintilis** Viereck (new species).

Type locality: Branford, 28 July, 1905 (H. L. V.).

*A. (P.) **quadrizonatus** Viereck (new species).

Type locality: Branford, 16, 19 September, 1904 (H. W. W.). Also from New Haven, 12 September, 1904 (B. H. W.); Stamford, 18 June, 1912 (H. B. Kirk).

*A. (P.) **footei** Viereck (new species).

Type locality: Stafford, 24 August, 1905 (W. E. B.), on flowers of goldenrod. Also from Pemaquid Point, Maine, August, 1906 (H. W. Foote).

***A. (P.) winkleyi** Viereck (new species).

Type locality: Branford, 5 July, 1905 (H. W. W.).

***A. (P.) brittoni** Viereck (new species).

Type locality: Torrington, 7 July, 1905 (W. E. B.).

A. (P.?) parvus (Cresson).

Very likely limited to the same region as the preceding species.

A. (P.?) jucundus (Brullé).

Guilford, 9 August, 1904 (H. L. V.); Bolton, 3 April, 1913 (D. J. Caffrey).

A. (P.?) comptus (Say). Possibly the male of *atrifrons*.

West Hartford, 29 August, 1904 (H. L. V.).

A. (P.?) subdolus (Cresson).

A. (P.?) paratus (Say).

A. (P.?) vinnulus (Cresson). Probably only a variety of *paratus*.

New Haven, 8 June (W. E. B.), 18, 22 August, 1904 (P. L. B.).

A. (P.?) milvus (Cresson).

A. (P.?) instabilis (Cresson).

Hosts: *Œneis norna* var. *semidea; Phyciodes tharos.*

Yalesville, 24 September, 1912 (H. B. Kirk).

°**A. (P.?) finitimus** Cresson.

°**A. (P.?) terminalis** (Cresson.)

A. (P.?) hospitus (Cresson).

Thompson, 11 July, 1905 (H. L. V.).

***A. (P.?) citrifrons** (Cresson).

***A. (P.?) putus** (Cresson).

Type locality: Connecticut.

A. (P.?) grandis (Brullé).

°**A. (P.?) rufiventris** (Brullé). Scudder, Butterflies of New England, Vol. iii, Pl. 88, Fig. 1.

A. (P.?) devinctor (Say). Howard, Insect Book, Pl. x, Fig. 12.

A. (P.?) **duplicatus** (Say).

A. (P.?) **lewisi** (Cresson)

Branford, 8 May, 1905 (H. W. W.).

A. (**Pterocormus**) **lætus** (Brullé). Same as *funestus* (Cresson), according to Knight, corroborated by Henry Bird in rearings from *Papaipema duplicata.*

Plainfield, 17 April, 1906, Scotland, 25 July, 1904, New Haven, 10 June, 1904 (B. H. W.); New Haven, 4 May 1904 (H. L. V.); on flowers of *Forsythia suspensa* and *Lonicera fragrantissima;* Torrington, 7 July, 1905 (W. E. B.); Meriden, May, 1913 (H. L. Johnson). Occurs throughout the State in June and July.

°A. (P.?) **velox** (Cresson).

°A. (P.?) **maius** (Cresson).

*A. (P.?) **signatipes** (Cresson).

°A. (P.?) **scitulus** (Cresson.

A. (P.?) **seminiger** (Cresson). Howard Insect Book, Pl. ix, Fig. 15.

New Haven, 7 May, 1904 (H. L. V.); Hamden, 25 May, Lyme, 5 August, 1911 (A. B. C.).

°A. (P.?) **volens** (Cresson).

°A. (P.?) **brevipennis** (Cresson).

Parasitic on (*Leucania, Heliophila*) *Cirphis albilinea.*

*A. (P.?) **disparilis** (Cresson).

Type locality: Connecticut.

A. (P.?) **utilis** (Cresson).

Parasite of the canker-worm. Possibly the male of *soror.*

°A. (P.?) **nanus** (Cresson).

Bred from *Acrobasis rubrifasciella.*

°A. (P.?) **longulus** (Cresson). Howard, Insect Book, Pl. x, Fig. 5.

°A. (**Melanichneumon?**) **viola** (Cresson). Howard, Insect Book, Pl. x, Fig. 20. *Cœlichneumon,* according to Morley.

°A. (**Cœlichneumon**) **cæruleus** (Cresson). Howard, Insect Book, Pl. x, Fig. 16. *Cratichneumon.*

Parasitic on the white-marked tussock moth, *Hemerocampa leucostigma.*

*A. (C.) **sassacus** Viereck (new species).

Type locality: Westville, 21 October, 1905 (W. E. B.).

A. (C.) **pulcher** (Brullé).

New Haven, 17 May, 1911 (W. E. B.).

A. (C.) **navus** (Say).

°A. (**Amblyteles**) **atrifrons** (Cresson).

*A. (A.) **ultus** (Cresson).

*A. (A.) **ultus** var. **rogalis** (Cresson).

A. (A.) **stadaconensis** (Provancher).

Salisbury, 27 August, 1904 (W. E. B.).

*A. (A.) **electus** (Cresson).

A. (A.) **detritus** (LePeletier).

*A. (A.) **nortoni** (Cresson).

Type locality: Connecticut.

A. (A.) **suturalis** (Say). *A. leucaniæ* Fitch.

A parasite of the army worm (*Leucania, Heliophila*) *Cirphis unipuncta*, New Haven, 17 May, 1905 (B. H. W.), on flowers of apple (*Pyrus malus*). Plantsville (A. Shepard).

°A. (**Trachichneumon**) **confirmatus** (Cresson).

°A. (**Tetragonochora?**) **insolens** (Cresson). Howard, Insect Book, Pl. ix, Fig. 13.

A. (**Barichneumon**) **soror** (Cresson).

New Haven, 3 August, 1905 (H. L. V.).

*A. (B.?) **duplicatiformis** Viereck (new species).

Type locality: Connecticut. Type in collection of American Entomological Society, Philadelphia.

*A. (**Ectopimorpha**) **anceps** (Cresson).

°A. (**Probolus?**) **rufizonatus** (Cresson).

CYNIPOIDEA.*

To this superfamily belong parasitic, guest or inquilinous, and gall-making species, which are seemingly intermediate between the aculeates and the almost exclusively parasitic forms of the order Hymenoptera.

The gall-making forms are in the majority, and are responsible for many of the abnormal growths that are to be seen on quite a variety of plants, especially oak trees. They are, when in the galls, attacked by birds, and by a host of parasitic insects belonging to the next succeeding superfamily of this order and possibly to even some others of the superfamilies of the Hymenoptera, so that it has been the wonder of students of these insects that any of them should survive to perpetuate their kind. There are many interesting aspects of the study of these mostly minute insects, and any one wishing to pursue the subject intimately will find an abundance of literature over which to browse. For references to some of the more interesting papers on these insects the reader may consult the bibliography given in the introduction to this work on the Hymenoptera of Connecticut.

Key to Families.

1. Dorsal abdominal segments not extending down along the sides so as to meet beneath ventral segments, therefore all or nearly all of the ventral segments visible 2

Dorsal abdominal segments extending down along the sides and meeting beneath, thereby completely enclosing or concealing the ventral segments or all of the ventral segments except a part of the apical one or the hypopygium ... FIGITIDÆ p. 363

2. Basal joint of hind tarsi usually shorter and never much longer than joints two to five united; abdomen not at all or very little longer than head and thorax combined CYNIPIDÆ p. 368

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*The classification here adopted is that of the late Dr. Wm. H. Ashmead.

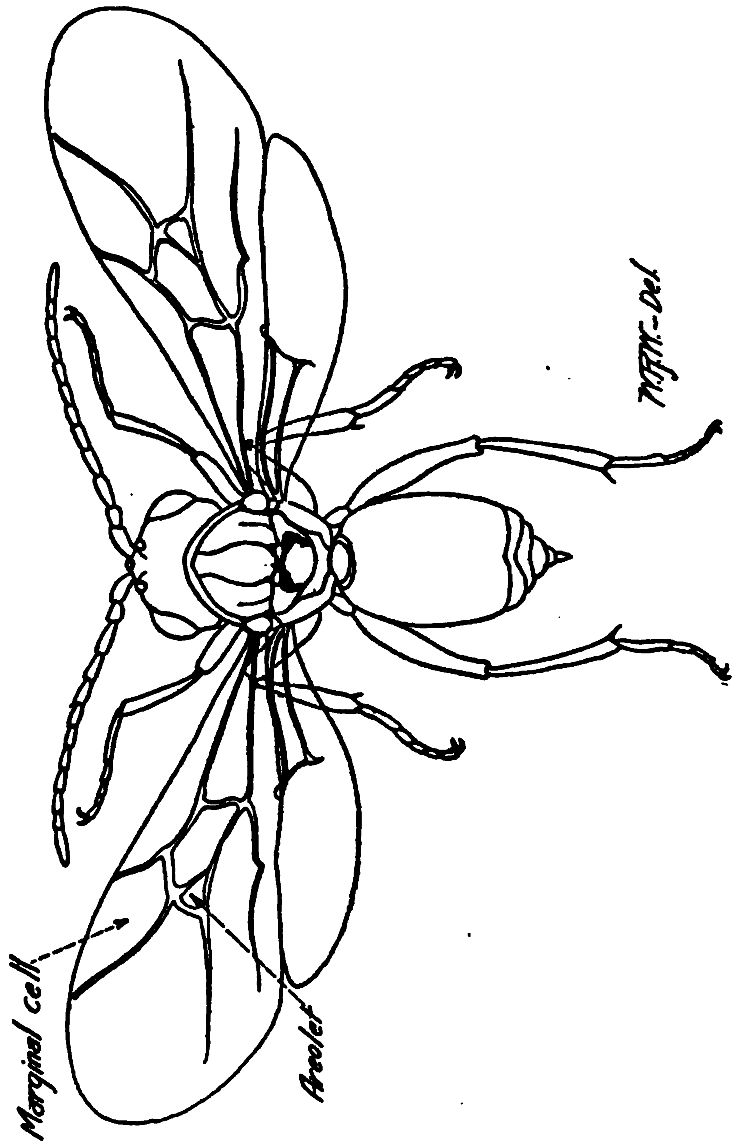

Fig. 10. *Diastrophus nebulosus.*

NOMENCLATURE OF WING PARTS IN THE DRAWING OF *DIASTROPHUS NEBULOSUS.*

OLD SYSTEM	COMSTOCK-NEEDHAM SYSTEM
Marginal cell	$Sc_2 + 2d\ R_1 + R_3$
Areolet	R_{4+5}

Basal joint of hind tarsi at least twice as long as second, third, fourth, and fifth joints united; second, third, and fourth joints of tarsi longer than fifth, second with a long spinous process extending outwardly; abdomen very distinctly compressed from side to side, spatulate, and distinctly longer than head and thorax united; first to fourth or even including fifth segment nearly equal in length to each other ....IBALIIDÆ p. 442

FIGITIDÆ.

Key to Genera.

Abdomen ovate, compressed or subcompressed from side to side, in some species distinctly petiolate, its apex usually pointed 2

Abdomen short, globose or subglobose, second segment longer than the others; scutel smooth and convex; hind tibiæ with only one apical spur; pronotum and legs without leaf-like dilatations; claws simple; mesonotum entirely without notauli; wings fully developed, marginal cell completely closed; antennæ 13-jointed in the female, 14-jointed in the male; scutel not foveate at base; wings much longer than abdomen ....**Xystus** p. 367

Scutel without a cup-like elevation above, usually foveate at base, spined or cone-shaped 3

Scutel with a cup-like elevation above; second abdominal segment always the longest and usually occupying most of the surface of abdomen; hind tibiæ with two apical spurs 8

Abdomen distinctly petiolated, second segment usually somewhat longer than third; scutel more or less conical, but never ending in a spine, separated from mesonotum by a suture or furrow, and with two oblique foveæ at its base; petiole of abdomen usually longer than hind coxæ, and smooth; propodeum not areolated ....**Anacharis** p. 365

Abdomen sessile or subsessile, or with a short petiole, second segment shorter than third 4

Second abdominal segment not prolonged dorsally, as seen from the side, and not tongue-shaped; cheeks margined; eyes hairy or pubescent; mesopleuræ separated from mesosternum by a sharp, longitudinal ridge or carina 6

Second abdominal segment prolonged dorsally, as seen from the side, tongue-shaped 5

Scutel not spined; mesonotum scabrous, opaque, with two distinct furrows and a median carina; scutel elevated and truncate posteriorly and with a channel throughout; marginal cell open at base and along fore margin, confluent with costal cell; female with antennæ 13-jointed, and filiform .... **Onychia** p. 365

Scutel ending in a spine; marginal cell open along the fore margin and sometimes at its base, confluent with costal cell; mesothorax carinate and scabrous or smooth and without carina, with notauli; female antennæ 13-jointed, filiform .... **Aspicera** p. 365

6. Marginal cell completely closed 7

Marginal cell more or less open along fore margin; scutel rugose, more or less carinate, and ending in a long acute spine; female antennæ 13-jointed, subclavate, male antennæ 14-jointed, filiform .... **Solenaspis** p. 366

7. Scutel rugose, rounded or obtuse at its apex, but never ending in a spine; head and thorax smooth, shining; female antennæ 13-jointed, subclavate, with their joints beyond the fifth oblong-oval, the third longer than the fourth, male antennæ 14-jointed, filiform; abdomen not much compressed from side to side .... **Figites** p. 366

Scutel rugose, more or less carinate, and ending in an acute spine which latter is sometimes channeled; female antennæ 13-jointed, subclavate, male antennæ 14-jointed, filiform, the third joint a little shorter than the fourth **Solenaspis** p. 366

8. Females 9

Males: characters the same as in the corresponding females except antennæ which are 15-jointed, and other particulars as noted below 11

9. Propodeum not produced into a long neck, abdomen at most subsessile, its base with a hairy girdle; front wings entire at apex, never emarginate or excised although sometimes truncate; apical portion of the submarginal vein slender, always two or more times longer than thick; wings fully developed and long enough to extend beyond tip of abdomen when lying over the latter; antennæ 13-jointed 10

Propodeum as in *Eucoila;* abdomen at base without a hairy girdle; mesonotum with notauli that are distinct to base of scutel, converging and meeting before reaching base of scutel, thence extending to base as a delicate carina; marginal cell closed; antennæ 12-jointed .... **Eucoilidea** p. 366

10. Marginal cell closed along front margin; wings bare, glabrous, not pubescent or ciliated; antennæ subfiliform, not ending in a distinct club, although slightly thickened toward apex, third joint a little longer than fourth .... **Eucoila** p. 366

Marginal cell open along front margin, closed at base, apical division of the submarginal vein distinct, wings pubescent, ciliate; abdomen not unusually compressed from side to side, hypopygium not very prominent; front wings with cubitus present and distinct; antennæ subclavate or clavate, more or less thickened toward apex, joints submoniliform **Cothonaspis** p. 367

11. Marginal cell closed 12
    Marginal cell open along front margin, not confluent with costal cell, apical portion of abscissa of submarginal vein always present, cubitus in front wings always more or less present or distinct, wings pubescent, ciliate; cup of scutel rather oval or ovate; first joint of flagel not longer than second ....**Cothonaspis** p. 367
12. Marginal cell closed along front margin, wings as in female; antennæ filiform and with cylindrical joints....**Eucoila** p. 366
    Characters as in female *Eucoilidea* except as to antennæ, which are 15-jointed ....**Eucoilidea** p. 366

Anacharis Dalman.

A. marginata Provancher.

Male: length 3 mm.; mostly black; antennæ brown at base, the remainder yellowish; scutel rugose, surrounded by a border; wings hyaline, veins brown to reddish black; legs stramineous, except the posterior coxæ, which are black.

A. sp.

New Haven, 19 August, 1905. Bred from *Baccha fascipennis* or *Phenacoccus* (W. E. B.).

Onychia Haliday.

O. provancheri Ashmead.

Female: length 4.5 mm.; mostly black; scutel, metathorax and sides of the rest of the thorax reddish; wings hyaline, veins yellowish, with a blackish tinge; legs brown to reddish with a blackish tinge, their femora infuscated; petiole of abdomen reddish; ovipositor hardly exserted.

Aspicera Dahlbom.

A. sp.

Female: length 4 mm.; black, except flagel, trochanters, femora, tibiæ, and tarsi, which are castaneous; wings hyaline, veins pale stramineous; ovipositor scarcely exserted.

Male: length 3.5 mm.; colored like the female, except the hind femora, which are mostly blackish.

Branford, 26 July, 1905 (H. W. W.). Also from New Haven, 20 July, 1904 (W. E. B.).

Solenaspis Ashmead.

S. armata (Say). *Diplolepis armatus* Say. *D. V-lineatus* Say.

Female and male: length 4 mm.; mostly black; antennæ reddish, with the first joint black; legs reddish or stramineous; wings hyaline, veins brown or brownish, scutel conical.

Figites Latreille.

Undoubtedly represented in the state although not yet recorded.

Eucoila Westwood.

Psilodora Foerster.

E. pedata (Say). *Diplolepis pedatus* Say.

Male: length 2 mm.; mostly black; third joint of antennæ a little arcuated and equal to the length of the fourth and fifth combined, antennæ yellowish with a blackish tinge; mandibles blackish; wings with a very slight blackish tinge, veins brown; legs stramineous.

E. stigmata (Say). *Diplolepis stigmatus* Say. *Kleidotoma maculipenne* Provancher.

Length 1.5 mm.; mostly black; antennæ mostly blackish, their basal joint yellowish, second joint almost spherical, second and third joints subequal in length; wings hyaline, veins yellowish; stigma triangular; legs pale stramineous; abdomen dull rufous.

E. impatiens (Say). *Diplolepis impatiens* Say. *Kleidotoma cupuliferum* Provancher.

Length 4 mm.; mostly black; antennæ blackish, mandibles reddish; scutel with a margin, deeply depressed and rugose; wings hyaline, veins pale brown; legs reddish or rather piceous.

Eucoilidea Ashmead.

Key to Species.

Female: length 2 mm.; all legs dark red; veins yellowish **canadensis**

Male: length 2 mm.; mostly black; antennæ red and longer than body; legs except femora, which are black at tips, stramineous; wings hyaline, their veins pale ......**longicornis**

E. canadensis (Ashmead). *Figites canadensis* Ashmead.

E. longicornis Ashmead.

Cothonaspis Ashmead.

Probably occurs in the state.

Xystus Hartig.

Allotria.

X. brassicæ Ashmead. Cabbage Aphis *Xystus,* or Cabbage Aphis *Allotria.*

This is a parasite of the cosmopolitan *Aphis brassicæ.* Length 1.2 mm. Female: mostly black; face and vertex stramineous; antennæ pale yellowish brown, or yellowish toward base, becoming brownish or infuscated at the tip; thorax smooth; wings clear, their veins yellowish; second abdominal segment but slightly longer than the third; abdomen more or less stramineous at base and beneath; legs stramineous or tawny yellow. Male: with the third, fourth and fifth joints of the antennæ almost equal in length, and each of these joints arched; pleuræ more or less stramineous.

X. avenæ Fitch. Oat *Xystus,* or Oat *Allotria.*

Length 1.5 mm.; mostly black; legs brownish; basal joint of the antennæ no thicker than the others, long, egg-shaped with its smaller end downward, and tapering into a short pedicel which is one-third the thickness of the joints and not as long as thick, the joints near the apex scarcely diminished in thickness and not at all in length, the apical joint egg-shaped; wings hyaline with a smoky tinge, their veins brown.

X. tritici Fitch.

Length 1.2 mm.; mostly black; head and legs pale yellowish; basal joints of the antennæ pale yellowish and more slender than the others, about three times as long as thick, obovate, transversely cut off at tip; second joint oval, twice as long as thick; third and fourth joints each as long as both the preceding and but half their thickness, slender; fifth joint thicker, and the following ones gradually increasing in thickness until they become equal in thickness to the basal joint; the joints near the apex three times as long as thick, and cylindrical, the terminal joint oval; head about twice as broad as long, face and mouth pale yellowish, vertex yellowish, with a blackish tinge; wings hyaline, slightly smoky, veins brown; end of abdomen blunt, with a thick papilla-like projection from its middle.

CYNIPIDÆ

Key to Genera.

1. Females 2

Males: base of scutel with two foveæ, or a transverse furrow 18

2. Wings rudimentary or wanting 3

Wings fully developed; base of scutel with two foveæ or a transverse groove 4

3. Scutel terminating in an obtuse thorn ....**Philonix** p. 380

Scutel obtuse posteriorly; notauli entire; antennæ distinctly 14-jointed; face with an obtuse carina extending from front to between antennal insertions, head broader behind eyes; ventral thorn only one to one and one-half times as long as thick; wingless, or with rudimentary wings..**Biorhiza** p. 383

4. First abdominal segment deeply longitudinally furrowed, second and third segments united, without suture; the entire face with sharp radiating furrows, frontal groove distinct, short or reaching to, or very near to, the lateral ocelli; marginal cell completely closed; antennæ 13-, 14-, or 15-jointed ....**Synergus** p. 377

First abdominal segment smooth; frontal groove entirely absent 5

5. Face without two distinct parallel carinæ 6

Face with two distinct parallel carinæ, extending from the insertion of antennæ to clypeus; antennæ 12- or 13-jointed, third joint as long as fourth; base of scutel with two shallow foveæ; propodeum with two parallel grooves; third abdominal segment larger than second, the two connate, but with a fine suture between them, these forming the greatest part of the abdomen; marginal cells closed ....
Ceroptres p. 375

6. Hypopygium not prolonged to a fine point, usually emarginate beneath, and often with a very short ventral spine; fore tibiæ with an indistinct or small spine; clypeus present, at least defined at the sides 7

Hypopygium plowshare-shaped, gradually narrowed to a fine point, without a prominent ventral spine; mesopleuræ on the lower half with strong, often wrinkled or deeply punctate, longitudinal groove, except in *R. dichlocerus;* margina cell closed; claws of hind tarsi entire..**Rhodites** p. 440

7. A suture between mesothorax and scutel, the latter with a distinct, more or less elevated carinate anterior margin 8

A suture between mesothorax and scutel, anterior margin of latter not thickened and carinate, in front of transverse groove, or, very rarely, feebly so; posterior margin of mesothorax medially arcuately emarginate and laterally more or less arcuately prolonged or rounded out, each pronounced emargination having also an interrupted transverse furrow, arcuately curved; notauli wanting or not distinctly marked; antennæ and tibiæ without long hairs.... **Neuroterus** p. 384

8. Abdomen without silky pubescence, almost entirely or entirely without hairs; apical third of antennæ not thinner than middle third; body not at all yellow, polished; disk of scutel margined; claws of hind tarsi distinctly or indistinctly bidentate or entire 9

Abdomen, especially from the third to the last segment, entirely or at least on lower two-thirds, covered with a rich silky pubescence, pretty much the same as head, thorax and legs; head much widened behind the eyes; mesothoracic ridges parallel or nearly so. Agamous form: claws of posterior tarsi bidentate; antennæ with second joint as long as or longer than thick; notauli complete, scutel somewhat broader than long, its base with two transverse furrows each closed externally by a carina ....**Cynips** p. 403

9. Abdomen with second and third segments not united; base of scutel either with an externally closed transverse groove or with two foveæ 10

Abdomen with second and third segments united, without or rarely with a trace of separating suture, so that only six free segments appear, segments two to three forming almost the entire abdomen; cheeks without furrow, the front laterally striped; head not wider behind eyes; prothorax not narrowed medially; base of scutel with two sharply marked foveæ; metathorax with two straight parallel longitudinal ridges; ventral spine at most scarcely twice as long as thick; marginal cell closed; antennæ 12-jointed; the third shorter, or at most as long as the fourth; flagel filiform; prothorax with two more or less distinct carinulæ converging above backwards; mesothorax finely alutaceous, punctate and hairy, or, as in *P. sylvestris*, very finely and feebly alutaceous; claws of posterior tarsi bidentate ....**Periclistus** p. 373

10. Genera not as in *Amphibolips;* scutel without a distinct longitudinal groove, except in the species of *Aulax*, in which the claws are entire 11

Scutel with a very distinct excavated longitudinal wrinkled furrow; cheeks at least half as long as eyes, apical third of 13- or 14-jointed antennæ not thicker than the middle; head and thorax, especially mesothorax and scutel, very deeply wrinkled and hairy, mesothorax with two distinct or indistinct, not polished, parapsidal grooves; base of scutel with moderately deep subquadrate foveæ, the disk somewhat broader than long, obtusely rounded posteriorly, and in the middle with an entire longitudinal groove; marginal cell open at wing margin, very brown or pale brown at base; claws of posterior tarsi bidentate ...... **Amphibolips** p. 404

11. Cheeks, at most, half as long as eyes; antennæ with apical third thicker than joints five to six; marginal cell elongate and open at wing margin 14

Cheeks more than half as long as eyes and without a furrow; flagel filiform, apical third not thicker than joints five to six; head not, or scarcely, wider behind eyes; prothorax not narrowed medially, or at least not strongly constricted; parapsidal grooves entire 12

12. Base of scutel with two sharply impressed foveæ; ventral spine, at most, a little longer than thick 13

Base of scutel without foveæ, but with a transverse furrow **Solenozopheria** p. 434

13. Claws of posterior tarsi entire; mesothorax often more or less polished; base of scutel with two very sharply separated foveæ, which are more or less triangular or quadrangular, and often very large; large triangular lateral foveæ not extending upwards and inwards, but lying on the free side of the scutel; antennæ 13- to 14-jointed, third joint shorter, or a little longer than the fourth...**Aulax** p. 374

Claws of posterior tarsi bidentate; mesothorax polished or nearly so ....**Diastrophus** p. 435

14. Genera not as in *Andricus;* metathoracic ridges, except in *Loxaulus*, not straight and parallel; base of scutel with a transverse furrow, or with two sharply limited foveæ, in the latter case the metathoracic ridges in the middle elevation of the metathorax strongly arcuate or angularly separated 15

Base of scutel with two sharply separated foveæ; metathorax with straight parallel ridges, or inferiorly somewhat divergent, rarely distinctly but not sharply serrulate, parapsidal grooves sharp and entire, often indistinctly defined anteriorly; mesothorax rarely transversely wrinkled; antennæ and tibiæ not fimbriate; third joint of antennæ longer than fourth or equal as in *A. tubicola*..**Andricus** p. 409

15. Claws of posterior tarsi entire; antennæ and tibiæ not fimbriate; mesothorax glabrous 16

Claws of posterior tarsi bidentate, mesothorax often abundantly hairy, scutel usually with an uninterrupted transverse groove 17

16. Parapsidal grooves of the polished or moderately deeply wrinkled mesothorax very sharply defined; antennæ with fourteen to fifteen joints, third as long as, or longer than fourth; base of scutel with two distinctly separated foveæ; moderately thick antennæ 14-jointed; mesothorax polished; body yellow or reddish yellow .... **Biorhiza** p. 383

Parapsidal grooves of the alutaceous mesothorax shallow, feebly or not at all impressed anteriorly; antennæ 13- to 14-jointed, third and fourth joints equal; middle arc of metathorax with a more or less distinct median longitudinal carina; cheeks with a sharp furrow; antennæ with thirteen joints, head distinctly broader behind eyes; base of scutel with an arcuate transverse groove, metathoracic ridges almost straight and parallel.......... **Loxaulus** p. 395

17. Parapsidal grooves on anterior third of mesonotum wanting; second abdominal segment with perpendicularly declivous posterior margin; entire body, with exception of the larger part of abdomen, abundantly hairy; antennæ and tibiæ not fimbriate .... **Holcaspis** p. 401

Parapsidal grooves entire; second abdominal segment above posteriorly prolonged, tongue-shaped or, when seen laterally, triangular; agamous form abundantly hairy; antennæ and tibiæ fimbriate; sexual form in great part bare; mesothorax polished, or nearly so, and very shining...... **Dryophanta** p. 396

18. First annular abdominal segment longitudinally sulcate; entire face with radiating grooves; frontal carina present, often very distinct and long, sometimes short and indistinct; marginal cell closed; antennæ with fifteen joints, frontal carina usually reaching to lateral ocelli .... **Synergus** p. 377

First abdominal segment annular or cylindrical, not grooved; frontal carina wanting 19

19. Face without carinæ as in *Ceroptres* 20

Face with two parallel carinæ extending from insertion of antennæ to clypeus, antennæ 15-jointed, third joint as long as fourth, emarginate; base of scutel with two faint furrows, metathorax with two parallel ridges; marginal cell closed .... **Ceroptres** p. 375

20. Mesopleuræ without a groove as in *Rhodites* 21

Mesopleuræ with their lower half provided with a strong longitudinal groove, often wrinkled or coarsely punctate, except perhaps in *R. dichlocerus;* cheeks longer than half of eyes, third joint of antennæ the longest; marginal cell closed; claws of posterior tarsi entire .... **Rhodites** p. 440

21. Second abdominal segment overhanging all the others; face with radiating striæ; mesothorax transversely wrinkled anteriorly; clypeus, at least laterally, well developed; a more or less distinct ridge on middle of anterior margin of scutel; cheeks with a sharp furrow, antennæ 14- or

15-jointed; flagel rather slender; all joints at least three times as long as thick; mesothorax polished, with sharply defined, entire parapsidal grooves; two foveæ at base of scutel separated by a carina; propodeum with two superior parallel ridges, which at middle of disc are strongly divergent, then angularly bent and converging to the peduncular thoracic articulation 22

Second abdominal segment not overhanging all the others; face with radiating striæ; mesothorax transversely wrinkled anteriorly, its posterior margin medially arcuately emarginate, and laterally more or less arcuately prolonged or rounded out, each pronounced emargination also with an interrupted transverse furrow, arcuately curved, parapsidal grooves wanting or not distinctly marked; abdomen petiolate; a suture between mesothorax and scutel, anterior margin of latter in front of transverse groove, not thickened and carinate or very rarely feebly so ...... **Neuroterus** p. 384

22. Genera not having the characters of *Periclistus*, as given below, nor those of *Xestophanes*, which are as follows: face, occiput, mesothorax, and mesopleuræ polished, bare and black; cheeks about half as long as eyes; antennæ 14-jointed, prothorax near middle of anterior margin provided with two foveæ, the space between these foveæ polished and bare, base of scutel with two sharply defined furrows; metathorax with two parallel longitudinal ridges; claws of posterior tarsi entire 23

Antennæ 14-jointed; mesothorax finely wrinkled, punctate and hairy or finely alutaceous and shining; base of scutel with two sharply marked foveæ, metathorax with two parallel ridges, claws of posterior tarsi bidentate; abdomen sessile, its second and third segments connate, with a more or less distinct suture between; marginal cell closed .... **Periclistus** p. 373

23. Cheeks half as long as eyes; base of scutel with two sharply marked foveæ; abdomen sessile 24

Cheeks less than half as long as eyes; marginal cell open.. 26

24. Claws of posterior tarsi distinctly or indistinctly bidentate, in the latter case the mesothorax sharply transversely wrinkled and the marginal cell closed; antennæ 13-, 14-, or 15-jointed 25

Claws of posterior tarsi entire; antennæ 14- or 15-jointed, third joint shorter, equal to or a little longer than fourth; base of scutel above with two very large or moderate foveæ, lateral foveæ lying in perpendicular side of scutel **Aulax** p. 374

25. Base of scutel with deep or moderately deep and not transverse foveæ; marginal cell open at the wing margin, sometimes closed in *D. radicum;* claws of posterior tarsi bidentate .... **Diastrophus** p. 435

Base of scutel without foveæ but with a transverse furrow **Solenozopheria** p. 434

26. Metathoracic carinæ strongly curved, rarely indistinctly so, in *Loxaulus* almost straight, in which case the scutel has a transverse groove; antennæ 15-jointed 27

Metathoracic ridges straight and parallel, or very slightly curved; antennæ 14- to 16-jointed, third joint longer than fourth; mesothorax with two sharply defined, entire parapsidal grooves, base of scutel with two very distinct foveæ; abdomen usually not pedunculate, rarely slightly so ..... **Andricus** p. 409

27. Parapsidal grooves sharply excavated and entire, mesothorax polished, or moderately coarsely wrinkled 28

Parapsidal grooves feebly defined or absent, mesothorax finely alutaceous, claws of posterior tarsi entire; cheeks with a sharply defined furrow, head broader behind eyes; base of scutel with an arcuate transverse furrow, metathoracic ridges almost straight and parallel; abdomen not petiolate .... **Loxaulus** p. 395

28. Reddish yellow; third joint of antennæ longer than fourth, externally strongly emarginate, and abruptly thickened near the notch; mesothorax polished, base of scutel with two sharply defined foveæ; abdomen not petiolate ...... **Biorhiza** p. 383

Mesothorax not reddish yellow and at the same time polished; abdomen distinctly petiolate; claws of posterior tarsi bidentate; posterior margin on upper side of second abdominal segment prolonged obliquely into a tongue-like process; head, thorax, and abdomen, black; mesothorax polished or nearly so .... **Dryophanta** p. 396

Periclistus Foerster.

P. pirata (Osten Sacken). *Rhodites globulus* Beutenmüller. *Aulax pirata* Osten Sacken. Globular Rose Gall.

Length 2 to 2.5 mm.; black, with legs and antennæ reddish yellow, base of coxæ, however, also black; wings hyaline; mandibles sometimes reddish; antennæ somewhat brownish in some females; male antennæ 14-jointed, the third joint very strongly excised on the under side; female antennæ 12-jointed, third joint not excised, last joint much longer than preceding but not quite equal to the combined length of the antepenultimate and the penultimate joints; third abdominal segment in the male longer than the second, in the female the second abdominal segment occupying nearly all of the abdomen.

Galls on *Rosa carolina*.

Stonington, 10 March, 1906 (B. H. W.).

P. sylvestris (Osten Sacken). *Aulax sylvestris* Osten Sacken.

Length 2.2 to 3 mm.; pitch-black, antennæ reddish; feet yellowish red; wings hyaline; abdomen brownish verging to chestnut brown or yellowish brown beneath; male antennæ 14-jointed; female antennæ 12-jointed; face aciculate, its scratches converging toward the mouth, front and vertex polished; prothorax opaque, dorsum of the mesothorax minutely punctate but shining, pleuræ with a polished quadrangular space, the lowest side of which is somewhat aciculated, scutel gibbose, deeply rugose punctate; second and third segments of the abdomen in the male equal in length, the second segment of the abdomen in the female covering nearly all of the rest of the abdomen.

Aulax Hartig.

Aylax.

***A. podagræ** Bassett.

Length 2.5 mm., the male somewhat shorter; female as follows: mostly black; vertex reticulated or punctate, antennæ dark brownish red, 13-jointed, first joint club-shaped, second joint half as long and the third as long as the first, the succeeding joints equal to each other in length and slightly shorter than the third; mesonotum with a few scattered hairs and with transverse wrinkles, also with two lines reaching half-way to the scutel, and with a median line, which latter is broadest at its origin at the scutel but disappears half-way between the latter and the pronotum, parapsidal grooves entire, in addition lines at the base of the wings; scutel rugose, its foveæ rugulose; legs concolorous with the antennæ; wings hyaline, their veins dark, radial area closed; abdomen polished, its second segment twice as long as the third, the two almost entirely covering the rest of the abdomen; male with the antennæ 14-jointed, the third joint curved and incised; the abdomen smaller in the male than in the female.

The galls in this species occur as rounded swellings at the leaf nodes of long hollow stalks of *Lactuca ? canadensis.*

The type locality of this species is probably Waterbury.

***A. tumida** Bassett. Lettuce Tumor Gall.

Length 3-3.5 mm. Female: head and thorax black; antennæ 13-jointed, translucent brown at the base to dusky brown beyond, the third, fourth, fifth and sixth joints equal in length, the succeeding joints subequal to the apical one, which is long and shows an indistinct annulation; facial ridge present, vertex distinctly reticulated, the head as a whole distinctly subquadrate; thorax sculptured like the vertex, pleuræ striate, the parallel lines on the mesonotum indistinct, median line present, parapsidal grooves almost parallel until close to the scutel, where they converge, lines from the scutel toward the base of the wings distinct; the appressed microscopic hairs on the thorax giving to it a silky appearance and somewhat obscuring the sculpture of the same; scutel slightly rugose and with somewhat coarser hairs than the rest of the dorsum of the thorax; foveæ of the scutel not smooth; legs dark reddish brown, claws simple; wings with a faint smoky tinge, their veins yellowish brown; areolet wanting; cubitus reaching two-thirds of the distance to the first transverse vein, radial area closed; abdomen shining, semi-translucent brown, its second segment with a small dense tuft of hairs far down on the sides of the anterior margin, in some specimens a few hairs seen over a much larger portion of this segment, the third segment a little shorter than the second. The male black, except for the legs and antennæ, the latter 14-jointed and dark brownish red, with the third joint curved and incised, and yellowish brown.

Galls occur as swellings of the main stalks of a variety of *Lactuca* that was found in an old and dry field.

The type locality of this species is probably Waterbury. Also Stonington, 14 April 1906 (B. H. W.), New Haven, 24 January, 1911 (A. B. C., B. H. W.).

Ceroptres Hartig.

C. petiolicola (Osten Sacken). *Amblynotus? petiolicola* Osten Sacken. *A. ensiger* Walsh?

Length 2 mm.; mostly black; head and thorax somewhat shining, smooth, slightly pubescent, the latter hardly punctate, scutel rugose; a slight carina between the antennæ, mandibles brown, palpi yellow, antennæ 12- or 13-jointed, mostly yellow, but with their bases blackish, four or five joints of the flagel nearest its base elongated; legs infuscated, except at the joints, tarsi pale, their tips black; wings hyaline, radial area closed, second transverse vein oblique and arcuated, areolet corresponding in position to the middle of the radial area; abdomen dark brown, shining, its petiole short, second segment pubescent at base, third segment more than twice as long as the second segment.

Bred from the gall of *Andricus petiolicola* Bassett. In addition to the above description it may be added that the male has the middle and hind femora and the corresponding tibiæ dusky, and a black line on the upper side of the fore femora; the female has apparently 13-jointed antennæ and infuscated femora.

C. pisum Osten Sacken. Oak Pea Gall.

Length about 3.5 mm. (female); head black, pubescent, mandibles and the mouth brownish red, face aciculate, with an oblong swelling under the antennæ, vertex microscopically punctate, antennæ 13-jointed, brownish yellow, almost filiform, nearly as long as the body, with the fourth joint slightly longer than the third, the following joints subequal except the last one which is twice the length of the joint next preceding, the apical joint sometimes divided into two parts by a distinct suture; thorax concolorous with the head, densely pubescent, but very delicately rugose, its parapsidal grooves distinct, the two very indistinct impressed lines between the parapsidal grooves extending some distance from the pronotum backward, scutel with a rough irregular sculpture, pleuræ with a polished space; legs yellow, except the extreme bases of the coxæ, especially of the hind ones, which are black, and the tip of the tarsi, which is infuscated; wing veins pale yellow, posterior portion of the areolet somewhat indistinct; abdomen dark brown or black, paler brown along its interior edge, its second joint divided into two unequal parts by a very distinct suture, the anterior part above a little less than half the length of the second, at the base of this second segment the abdomen distinctly downy, ventral valve pale brown, sheaths of the ovipositor not at all projecting above the dorsal line.

Bred from *Cynips pisum* Fitch.

C. ficus' Fitch. *Cynips quercus-ficus* Fitch. *Synophrus læviventris* Walsh.

Length 2.5 mm.; mostly black, but with the lower half of its head, its antennæ and legs, pale dull yellow, its hind femora dusky, and its abdomen reddish brown beneath; antennæ in the female 13-jointed, in the male 15-jointed.

Bred from galls surrounding the twigs of white oak. These galls occur in dense clusters and are packed together so closely as to be faceted where they adjoin each other; furthermore, the individual galls are hollow, bladder-like, and of the pale, dull yellow color of a faded oak leaf.

Waterbury.

C. tuber (Fitch). *Cynips tuber* Fitch. *C. quercus-arbos* Fitch.

Length 2 mm.; mostly black, but with antennæ, mouth and legs, dull, pale yellow, hind femora and the antennæ towards the tips dusky; male antennæ 14- or 15-jointed, female antennæ 12-jointed. The male with 14-jointed antennæ and the female with 12-jointed antennæ as described by Fitch are questioned by Bassett as to their belonging to this genus.

Synergus Hartig.

S. campanula Osten Sacken.

Length 2-2.5 mm. (female); head black, except the face which is brownish below the antennæ and brownish yellow above the mouth, the brownish or yellowish coloring sometimes extending along the eyes to a point above the insertion of the antennæ; vertex black, smooth and shining; antennæ brownish yellow, a little shorter than the body, 14-jointed, the fourth joint a little shorter than the third, the following joints subequal in length except the fourteenth or apical joint which is about one and a half times as long as the joint next preceding; thorax black and but little shining, with dense, delicate, transverse rugæ evenly spread over its upper surface, which in addition has a fine scattered pubescence, its parapsidal grooves not very deep, but distinct, a vestige of an intermediate furrow visible toward the scutel, two minute parallel glabrous lines running a short distance from the middle of the pronotum backwards; scutel gibbose, densely rugose, its basal foveæ rather small; pleuræ with a smooth black polished space, the lower part of which is finely aciculate;

scapulæ yellow; legs brownish yellow; tips of the tarsi brown; wing veins pale, areolet almost obsolete, the prolongation of the second transverse vein only being distinct; first segment of the abdomen longitudinally striate, the second segment concealing all of the following, the tip of the sheath of the ovipositor sometimes, although not always, protruding behind the hind edge of the second segment; the abdomen polished and black, sometimes brownish along the hind edge.

S. dimorphus Osten Sacken.

Female: length 3-3.3 mm.; head black, except the face, which is brownish red mixed with black below the antennæ; mandibles, except their tips, which are black, and more or less space near their bases on the cheeks, yellowish; the brownish coloring of the face extending along the eyes above the insertion of the antennæ as a narrow stripe; vertex black, rather shining, with sparse, umbilicate punctures; antennæ brownish yellow, 13-jointed, about three-fourths as long as the body, the fourth joint a little longer than half the third, the fourth, fifth and sixth joints nearly equal in length, the succeeding joints somewhat shorter, except the last joint, which is about equal to the two next preceding combined; thorax black, moderately shining, with transverse rugosities; pubescence short and very sparse, parapsidal grooves distinct, punctate at the bottom, scutel coarsely sculptured, its basal foveæ indistinct, the smooth space of the pleuræ almost entirely aciculate, scapulæ brownish yellow; legs brownish yellow, hind tibiæ and a part of the first joint of the hind tarsi infuscated, tips of all the tarsi brownish; veins of the wings brownish; first segment of the abdomen longitudinally striate, the second segment concealing all of the following; ventral valve ending in a short pubescent point and usually projecting beyond the edge of the second segment; abdomen polished and black, its ventral valve yellowish brown. Male: length 2.5 mm.; antennæ 15-jointed, the third joint excised below, fourth joint half as long as the third; head yellow, except a black spot on the vertex, which includes the ocelli; a part of the pronotum and of the pleuræ also yellow, the yellow seemingly variable in extent in different individuals; abdomen truncate at the tip, bell-shaped when seen from the side; the sculpture of the head and thorax and the coloring of the legs the same as in the female.

S. læviventris (Osten Sacken). *Synophrus? læviventris* Osten Sacken.

Female: length approximately 2 mm.; head reddish brown; vertex darker; antennæ brownish yellow, second joint not much shorter than the fourth, the third about one-third longer than the fourth, the fourth, fifth and sixth joints about equal in length, the fourteenth or apical joint somewhat less than one and one-half the length of the preceding; thorax black, shining and finely rugose, punctate and pubescent; scutel gibbose, with a slight, sharp, recurved, elevated margin; thorax and scutel may be brownish or reddish brown; parapsidal grooves distinct their whole length; foveæ at base of scutel distinct; pleuræ black or brownish, polished under the wing, scratched below, punctate anteriorly; legs brownish yellow, except extreme tips of tarsi, which are more or less brownish; the hind tibiæ and tarsi may be somewhat infuscated; wings hyaline, veins pale, areolet almost wanting, with only the second transverse vein or its outer portion at all distinct; abdomen with its first dorsal segment striate, its second dorsal segment covering all of the following segments and chestnut-brown or black, ovipositor sometimes exserted.

S. oneratus (Harris). *Cynips oneratus* Harris.

Length 3-3.5 mm.; color variable, middle of the thorax and of the head with a black stripe of greater or less extent, though in some specimens there is no black at all on the head, and the stripe on the thorax may be obsolete; third and fourth joints of the antennæ nearly equal in length and much longer than broad, fourth joint a little shorter than the third, the following joints subequal, except the thirteenth joint, which is about twice as long as wide, and the fourteenth or apical joint, which is about one and one-half times the length of the preceding.

S. lignicola Osten Sacken. *S. rhoditiformis* Walsh.

In this species the pronotum has a brown or black spot in the middle, which is more or less extended, being sometimes confined to a narrow brown line in front of the angle formed by the mesonotum anteriorly, and sometimes extended into a large black spot which crosses in some individuals to its fellow; the sternum is black, and the middle coxæ not inserted on yellow sockets; the ventral valve is not always of a highly polished black, but sometimes pale.

Bred from *Quercus tinctoria* and *Q. palustris.* It is thought probable that the individuals are separable into two races respectively referable to the trees upon which they make their galls.

S. mendax Walsh.

Sculpture of the mesonotum rough, consisting apparently of transverse projecting ridges, with intervening smooth and moderately shining spaces, the polished spot on the pleuræ almost smooth; ventral valve with a distinct projecting point beyond its tip.

Bred from the gall of *Andricus podagræ.*

S. lana Fitch. Oak Wool Gall-fly.

Female: length 2 mm.; mostly black, with a white or straw-colored head; antennæ and legs concolorous with the head; abdomen shining smoky yellow, and with a black or blackish cloud occupying the back and sides; antennæ 15-jointed.

The gall is a round mass of a woolly nature, of the size of a hazelnut or a walnut, and of a white or buff color, and grows upon one of the principal veins on the under side of white oak leaves.

" Specimens of this gall in the Station collection were taken in the state, but are without exact records."

Philonix Fitch.

Acraspis.

P. gillettei Bassett.

Female: length 3 mm. or a trifle longer; head and thorax, including their appendages, except the wings, mostly reddish brown; antennæ 14-jointed, the second joint three-fourths the length of the first, the third one and one-half the length of the first and second combined, the fourth equal to the first and second together, and half as long as the third, the sixth to thirteenth equal, the fourteenth pointed and only half as long as the preceding joint; vertex of the head hairy, though sometimes bare; mesonotum either with or without hairs above, pronotum obscure and with dense fine white hairs, the anterior border of the mesonotum apparently depressed, parapsidal grooves present but indistinct, median lines absent, scutel small, hairy, its hairs longer than those on the mesonotum, foveæ wanting; legs dusky and more decidedly reddish brown than the other parts of the body; abdomen shining black, the second segment with fine microscopic hairs on its sides anteriorly, the segments distinct and gradually shorter beyond the second anal segment, with a tuft of long hairs; wings rudimentary and not much more than 1 mm. long.

The galls of this species are about 7 mm. in diameter, orbicular, and slightly uneven or pimply, each pimple crested with a tuft of hair-like filaments, pale ash-gray in color but brown or black when weathered; the larval cell is central and is kept in place by a spongy mass that is loosely fibrous on the inner surface of the gall; the cell itself is oval and measures nearly 4 by 4.5 mm.; the shell is very thin and hard; the galls are found as a rule upon the leaves of the white oak (*Quercus alba*), on the tops of tall old trees. They are said to be rarely abundant but to occur occasionally in great numbers on an isolated tree or in a small grove of oaks.

This species may be confused with *P. niger* Gillette, from which it may, however, be determined by comparison with the above description.

°**P. fulvicollis** Fitch.

Length: 3 to 4 mm.; mostly black, with the thorax tawny yellow, spotted anteriorly with black, the scutel brighter yellow, and the legs dusky or blackish, with the knees and hips of a paler dull yellowish color; antennæ practically entirely black.

This species appears on the first snows that fall in the latter part of November and the beginning of December.

°**P. nigricollis** Fitch.

Length 3 mm.; mostly black, with the basal third of the antennæ and the legs obscure brownish yellow, scutel dull yellow, the inner sides of the femora slightly dusky.

°**P. (Zopheroteras) vaccinii** Ashmead.

Length 2 mm. (female); head and thorax dull brown; abdomen black, shining, or mostly black and distinctly brownish at base; antennæ 14-jointed, beyond the eighth joint infuscated; parapsidal grooves very indistinct, scutel terminating above in an elevated horn-like process; all tibiæ dark brown along the outer edges; wings entirely wanting, not even wing scales being present.

Bred from clusters of small, somewhat bell-shaped, petiolate, greenish galls on the under sides of leaves, along the midrib. The shape of these galls is suggestive of the flowers of *Vaccinium*, and they are attenuated at the base into a short petiole which is fastened to the midrib of the leaf; the opposite end is an excavated truncature; the length of the galls from the end of the petiole to the opposite end is 3-4 mm. They grow in numbers, so that at times there are ten or more together, with six, for instance, forming a row on one side of the midrib, and four or five on the opposite side.

°**P. macrocarpæ** Bassett.

Length 3 mm.; head black, antennæ black, 14-jointed, nearly as long as the body, the first joint ovate, the second oval, the third twice as long as the two preceding taken together, the fourth, fifth, sixth and seventh subequal, as are the remaining ones; face and cheeks hairy; thorax appearing grayish owing to its being covered with short appressed hairs, parapsidal grooves present but obscured by these hairs; scutel comparatively large and elevated posteriorly, nearly as long as the mesonotum; wings veinless, the narrow scales as long as the entire thorax; legs dark brown, claws with two teeth; abdomen black, compressed from side to side, sides of the second, third, fourth and fifth segments covered with short appressed hairs, dorsal and ventral parts and the segments of the apical portion of the abdomen smooth and shining.

The galls of this species are oval in form and nearly 4 mm. long by 3 mm. thick. They are generally found on the lateral veins on the under side of leaves of *Quercus macrocarpa*, but occasionally they are found on the upper side. They are attached lengthwise to the vein and the point of attachment is about 2.5 mm. long. The opening made by the gall-fly when it emerges is invariably on the end towards the base of a vein. The same is often true concerning parasites of this species.

°**P. prinoides** (Beutenmüller). *Cynips ? prinoides* Beutenmüller. Spiny Oak Gall.

Length 3.5 mm.; head pitchy black, opaque, rugosely punctate; eyes surrounded with a rather broad reddish brown ring, antennæ black, 13-jointed, with the first, second, third and fourth joints elongate and about equal in length, the remaining joints subequal in size; thorax dull reddish brown, darker in color at the sides and deeply but finely punctate; legs shining, reddish brown and with a few short yellowish hairs which are also present on the head and thorax; abdomen jet black and polished:

ovipositor with a few light colored hairs; on the under side of the abdomen, a little beyond the middle and near to each other, are two bunches of rather long yellowish hairs, and a few very short hairs of the same color are also present on the under side of the abdomen at its base.

The gall of this species is globular and about 12 mm. in diameter; it is covered with numerous conical projections. When fresh it is light green tinged with red. The single cell is in its interior. These galls have been found on the upper side of the leaves of the dwarf chestnut oak (*Quercus prinoides*) in the latter part of August and early in September.

Biorhiza Westwood.

°**B. (Xystoteras) nigra** Fitch.

Length 2 mm.; black throughout, including legs and antennæ; entirely wingless.

***B. hirta** Bassett.

Length 3.5 mm.; head black, vertex slightly rugose, densely hairy, the same as the entire dorsal surface of the thorax; face pubescent, with its hairs converging toward the mouth; palpi shining brown, their tips black; antennæ black, 14-jointed; thorax black, mesothorax not visibly striate, owing to the presence of the pubescence; legs dull brownish black or very dark reddish brown, posterior pair lightest and all somewhat paler at the articulations than elsewhere; wings represented by mere yellowish white scales; abdomen black and shining, with a short, closely bunched pubescence on each side of the second segment, the second segment as well as the remaining segments, except the first, bounded across the back and sides along the posterior edge by a belt of long silvery white hairs. These belts are divided on the dorsal ridge by a shining glabrous line like the anterior portion of the segment; furthermore, they are visible to the naked eye.

The galls of this species are hard and round and approximately 6 mm. in diameter, their surface is finely papillose, and their substance has a solid radiated cellular structure; they are to be found growing sometimes on the upper but as often on the under side of the leaves of *Quercus ilicifolia*, and are attached to the larger veins by a very short pedicel.

B. (Xanthoteras) forticornis Walsh. Oak Fig Gall.

Female: length 2-2.5 mm.; mostly rufo-sanguineous; head nearly twice as wide as long and twice as wide as the thorax, scarcely polished but glabrous; antennæ brownish black, opaque, nearly as long as the body, with all the joints except the first, third, fourth and fourteenth as broad as long; 14-jointed, the apical joint half as long again as the penultimate, and the first and third tapering to a mere film at the base; thorax narrow, glabrous, a little polished, with only two rather coarse mesonotal striæ converging but slightly at the scutel, which latter is opaque, longitudinally semioval, and has a suture before it which is deeply impressed, but without any foveæ; legs dull rufous or reddish brown, the hind femora and tibiæ and the tips of all the tarsi generally brownish; wings reduced to an elongate triangular gray scale and extending only one-third of the way along the second abdominal segment; abdomen black, highly polished, the second segment occupying about one-half of its dorsal or one-third of its lateral length, the first joint very small, viewed laterally apparently a little longer than wide, the dorsal edge of the second joint describing a circular arc of about 25°; the ventral valve very hairy, yellowish subhyaline, its tip at an angle of about 80°, the dorsal valve large and hairy; sheaths of the ovipositor generally exserted and directed upwards and backwards, tip of the ovipositor exserted.

Manchester, 24 September, 1906, New Haven, 26 January, 1911 (B. H. W.); Mystic, 3 March, 1915 (I. W. Davis).

Neuroterus Hartig.

***N. batatus** Bassett. Oak Potato Gall.

Female: length 2 mm.; mostly black and shining; vertex smooth; face covered with a fine thin pubescence; palpi clear and brown; antennæ 13-jointed, first, second and third joints pale yellow, the following joints pale, semitranslucent brown; thorax black and shining but under a strong magnification showing a network of fine lines; parapsidal grooves and striæ obsolete; scutel smooth and polished, a few scattered hairs on its posterior portion, basal pits wanting; scutel separated from the mesothorax by a deep shining groove; legs with their coxæ clear yellowish brown, their femora in the middle dark brown or black, as are also the tibiæ of the posterior pair, remaining portions except the tips of the tarsi, which are black, of the same color as the coxæ; wings hyaline, all the veins dark brown and of nearly equal size, the cubitus distinct throughout, radial area open; abdomen polished. Male: a little shorter than the female, with 4-jointed antennæ; its legs dull pale yellow; abdomen petiolate, owing to the elongation of the first segment.

Found on twigs of *Quercus alba.*

New Haven, 24 January, 1911 (A. B. C., B. H. W.).

***N. majalis** Bassett.

Female: length 2 mm.; head black, very finely reticulated; face smooth and with sparse white hairs; mouth brown, tips of the mandibles black; antennæ 13-jointed, first and second joints short, third joint very long and enlarged at the upper end, these joints, except the slightly enlarged portions of the third, pale yellowish white, the remaining joints of a light opaque brown; thorax black, smooth and shining, without any grooves or striæ whatsoever on the mesonotum; scutel smooth, and separated from mesonotum by a broad shallow groove, fovæ wanting, marked posteriorly by two deep transverse grooves, causing three transverse ridges above the insertion of the abdominal petiole; legs white, with a tinge of yellow like the basal joints of the antennæ; wings large, with a faint duskiness and a dusky cloud on the first transverse vein, veins dull brown, areolet present, radial area open, long and very narrow; abdomen smooth and black. Male: 2.5 mm. long; head black; antennæ 15- jointed, first, second and third joints paler than the corresponding ones in the female, the remaining joints of a semitranslucent brown color, the third joint very long, the succeeding ones short and of equal length, the third joint curved rather than incised; thorax with the legs very light yellowish brown, the central part of the mesonotum dark brown; abdomen with its terminal segments dark brown or nearly black, the first and part of the second segments very light yellowish brown.

The gall of this species occurs on *Quercus alba.*

Type locality: Waterbury.

°**N. verrucarum** Osten Sacken.

Length a little more than 1 mm.; mostly black and shining; mouth reddish; antennæ 13-jointed, somewhat thickened toward the tip, brownish or brownish black, pale toward the base, espe-

Occurs at Waterbury, in midsummer. This locality is the type locality of the species.

N. distortus Bassett.

Female: length 1.5 mm.; mostly black; antennæ 13-jointed and similar to those in the male except the third joint, which is shorter, and the color as a whole, which is of a darker shade; abdomen not petiolate. Male: as long as the female; mostly shining black and smooth; antennæ 14-jointed, first and second joints combined as long as the third, fourth two-thirds as long as the third, fifth to the twelfth equal in length, all of the joints dusky brown; thorax rounded, scutel rounded and separated from the mesonotum by a shining groove; legs clear pale brown, middle of the femora darker but almost transparent and paler at the joints; wings subhyaline, veins pale clear brown, all distinct and complete and equally developed; abdomen with a slender petiole, the following segments, seen from the side, forming a rounded disk, the length and breadth of which are about equal.

The type locality of this species is probably in Connecticut. The galls are to be found on the branches of *Quercus bicolor*, where the original ones were found 25 May, 1893.

N. dubius Bassett.

Female: length 1.5 mm.; mostly black; head with its vertex microscopically sculptured, antennæ 14-jointed, first and second joints equal in size, rather large, the third joint one and one-fourth times as long as the first two combined, the fourth about two-thirds as long as the third, the fourteenth with an indistinct suture, the first, second, third and fourth joints pale yellowish red, the rest dusky reddish brown; thorax rounded, hardly smooth but still shining, with two diverging grooves above extending from the scutel to the bases of the wings, scutel finely and evenly rugose, without foveæ, but with a broad groove separating it from the rest of the thorax, the broadest portion of which is in the centre; legs pale yellowish; wings subfuscous, the veins distinct, radial area open; abdomen smooth and shining and vertically deeper than long. Male: as long as the female; antennæ 15-jointed, the first and second joints rather shorter than in the female, the first dark and shining at its base, the third pale yellowish brown and semitranslucent, the remaining joints very dark opaque brown; head dull shining black; thorax also dull shining black; legs pale but less so than in the female and inclining to yellow; wings as in the female; abdomen pedicelled, concolorous with the thorax and dull and shining.

The type locality of this species is probably Connecticut. It was found among the galls of *Andricus prionosus.*

***N. exiguissimus** Bassett.

Length 1.25 mm.; head black, antennæ 13-jointed, first and second joints black, the third to the thirteenth dusky brown, and of equal length, the second joint larger than the first and ovoid; thorax smooth, scutel shining, with a curved groove, but without foveæ at its base, smoother and more polished than the mesonotum; legs dark brown with pale joints, tarsi dusky, claws black; wings hyaline, veins pale, cubitus inconspicuous, the veins bounding the areolet laterally hardly perceptible, radial area open; abdomen compressed, smooth and black.

Type locality: Waterbury, on *Quercus alba.*

***N. exiguus** Bassett.

Female: length 1.5 mm.; antennæ 13-jointed, first joint ovate, second much smaller than the first, third equal to the first two combined, which are of uniform length, color clear semitransparent brown; thorax polished, very black, its surface wrinkled, scutel rounded, shining black, as is also the transverse groove at its base, this groove large and incurved; legs dark clear brown but paler at the joints; wings smoky and pubescent, veins distinct, cubitus reaching quite to the first transverse vein, radial area open by virtue of a curvature in the second transverse vein at the base of the areolet, the outer angle acute and the inner a right angle; abdomen black but less brilliant than the thorax, and triangular owing to the retraction of all segments within the first. Male: as long as the female; mostly black; antennæ clear brown, 15-jointed; legs concolorous with the antennæ though a little paler at the joints; abdomen petiolate, shining brown.

Type locality: West Rock, New Haven. Found among galls of *Andricus exiguus.*

***N. tectus** Bassett.

Female: length 1.25 mm.; head black; antennæ 13-jointed, third joint equal to the first and second combined, fourth two-thirds as long as the third, the following joints except the thirteenth subequal in length; thorax black and smooth, parapsidal grooves wanting, scutel rounded, polished, and separated from the mesothorax by a broad arcuate groove; legs pale translucent brown at the joints, changing to an almost polished black in the middle of the femora and tibiæ; wings hyaline, veins dark and distinct, radial area open; abdomen black and forming in outline an equilateral triangle. Male: head shining black; antennæ 14-jointed, the third joint one-third longer than the first and second combined, the fourth equal to the first and second together, fifth to thirteenth joints equal in length, the antennæ as a whole of a clearer, more shining brown than in the female; thorax and abdomen concolorous with the head.

Type locality: Waterbury, 29 April, 1874. Found ovipositing in the buds of a low spreading bush of *Quercus prinoides.*

N. umbilicatus Bassett. Oak Button Gall.

Length 1.5 mm.; antennæ with the second joint as thick as the first but a little shorter and less tapering toward the base, the third as long as the first and second combined, the fourth to thirteenth subequal, the last three forming a thickened club with obscure articulations; thorax polished, hairless or seemingly so, and without grooves, scutellar foveæ wanting; legs rather translucent dark and shining brown, in some individuals nearly black, always lighter at the joints; wings hairy, veins pale, areolet distinct, radial area open, cubitus equal throughout and reaching to the first transverse vein, the first transverse vein dark brown, the other veins pale or colorless; abdomen as long as high and subtriangular in outline.

The type locality of this species is probably Connecticut. The galls from which it was reared are flattened circular, and were found on the under surface of the leaves of *Quercus bicolor.*

New Haven, 30 September, 1896 (W. E. B.).

°**N. floccosus** Bassett. Oak Flake Gall.

Length 1 mm. or a little longer; mostly shining black and smooth; antennæ 13-jointed, the third joint a little longer than the first and second combined, the succeeding ones slightly increasing in thickness toward the last, antennæ as a whole of a pale dusky, yellowish brown; thorax without grooves, scutellar foveæ wanting; legs dark brown, except the joints and the tarsi, which are almost colorless; radial area open, the vein bounding the areolet on the posterior side exceedingly faint; abdomen smooth and shining, subpetiolate, the terminal segments in museum specimens almost entirely concealed under the second segment.

The galls of this species occur on the under sides of the leaves of *Quercus bicolor,* especially the late terminal leaves of the hardy shoots of young oaks of this species. They are often very numerous, as is shown by the fact that as many as two hundred have been counted on a single leaf. When as numerous as this, or nearly so, the galls are apt to be confluent. Usually they are separate, about 4 mm. in diameter, including the woolly covering, without which latter they are only 1-1.5 mm. across. Each gall contains a single larva which is free and not enclosed in a cell. In addition to the above description it may be said that the galls are hemispherical and attached with the flat side to the leaf, showing on the upper surface only as smooth, flat, shining blisters.

*__N. noxiosus__ Bassett. Noxious Oak Gall.

Summer female*: length 2 mm.; head black, finely and uniformly punctate; antennæ 13-jointed, the first joint nearly black, the second and third joints brownish yellow, the succeeding joints merging gradually into dark dusky brown; thorax microscopically sculptured, without parapsidal grooves, scutel sculptured like the mesonotum though somewhat coarser and without foveæ; legs dark shining brown, with yellowish brown joints, tarsi dark yellowish brown; wings hyaline, veins distinct and nearly all black, areolet sharply defined, radial area open; abdomen smooth shining black, the ovipositor distinctly exserted. Male: differing from the vernal female† as follows: body longer than 1.75 mm.; antennæ 14-jointed, the third joint curved but not incised; legs clear yellowish brown; abdomen small, and with a slender petiole.

The summer galls of this species are large, woody, polythalamous, terminal or subterminal swellings on the twigs of *Quercus bicolor,* varying greatly in size and form, but usually tuber-like and three or four times as long as thick, the larger specimens being nearly 1 inch in diameter and 4 inches long and containing a large number of specimens of the insect. The smallest are almost imperceptible swellings and have often but a single gall-fly in them; these galls give rise to the females which live in the galls over winter and come out before the leaves appear in the spring. The galls just described are usually preceded in the spring by a crop which affects the leaves only, and causes an enormous development of the midvein, often to the extent of an inch in diameter and an inch and a half in length. These latter galls are smooth and green but irregular in shape, succulent and a little harder than an unripe grape. The blade of the the leaf becomes dwarfed and curled, and then after the galls mature it becomes dry. In some seasons these galls are so abundant on certain trees as to affect nearly all of the early leaves. The galls are filled with larval cells from which are produced great numbers of both sexes of the gall-fly about the 20th of June. Thus these latter galls may be looked upon as the progenitors of the bisexual generation of this species.

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* Female from summer galls.

† Female from vernal galls.

New Haven, 24 January, 1911 (A. B. C., B. H. W.).

°**N. (Dolichostrophus) irregularis** Osten Sacken.

Length 2 mm.; head brown, mouth yellowish, antennæ pale yellow, third joint twice as long as the fourth, somewhat curved, attenuated toward the base but stouter toward the tip, the fifth, sixth and seventh joints almost equal in length; thorax brownish above, pale beneath, smooth and shining; legs pale, except the tips of the tarsi, which are infuscated; wings somewhat grayish, radial vein almost parallel with the anterior margin, areolet distinct, as are the cubital vein and the first transverse vein or basal vein, the latter dark brown with a brownish cloud, the other thick veins of a paler brown.

The galls of this species were found on the leaves of the white oak.

N. perminimus Bassett.

Female: length scarcely 1 mm.; head black, antennæ 13-jointed, mostly dusky brown; thorax almost black, without parapsidal grooves, scutel somewhat roughened and without foveæ; legs translucent brown but paler at the joints; wings hyaline, veins distinct, radial area open; abdomen black. Male: head dark, but not quite as black as in the other sex; antennæ 14-jointed; thorax highly polished and dark brown; legs pale and almost glassy in appearance; abdomen petiolate, triangular in outline, and of a reddish brown.

The galls of this species are scarcely 1 mm. long and 1 mm. wide and 1 mm. deep. They lie embedded in the lamina of white oak leaves, are pustule-like in form, and oval and apparent on both sides of the leaf, though more distinctly on the upper than on the under side. As many as two hundred of them may be found on a single leaf of ordinary size. Since many of the individuals become infested with parasites, very few of the hosts ever reach maturity. The galls mature about the 25th of June and the imagos hatch out before July 10th in Ohio.

N. affinis Bassett.

Female: length 2 mm.; mostly black; head finely rugose, antennæ 14-jointed and inserted upon a protuberant base, the first joint truncated, the second ovoid, the third one-fourth longer than the first and second combined, the fourth equal to the first two, the fifth to tenth gradually shorter, the remaining four subequal, the apical joint pointed; antennæ as a whole yellowish brown, especially toward the base, and dusky brown toward the tip; mesothorax very finely and evenly punctate, parapsidal grooves wanting, scutel punctate and separated from the mesothorax by a rather broader shining groove; legs shining, almost translucent brown, with a darker shade on the trochanter and on the upper half of the femur; wings smoky, veins smoky brown, areolet an isosceles triangle with the narrow base on the second transverse vein, cubitus reaching to the first transverse vein, radial area open, but the subcostal vein extending above the base for a short distance, and the anterior border of the wing somewhat thickened, which in certain lights causes the radial area to appear closed; abdomen petiolate, black and shining. Male: a little longer than the female; antennæ 15-jointed, third joint deeply incised, antennæ colored as in the female; legs paler, the femora not at all brown; abdomen black and shining throughout and with a slender petiole.

The galls of this species are monothalamous, round, and thin-walled, and occur in the buds of *Quercus prinoides,* usually partly hidden in the scales of the bud, but in some instances standing out free like a little blister on the twig. They are only large enough to hold the larvæ within them, and are dark brown in color, with raised spots, or else entirely brown. These galls are half grown in the autumn and develop so rapidly in the spring that the inmates come out just as the leaves begin to expand.

N. vesicula Bassett.

Female: length a little more than 3 mm.; antennæ pale brown at the base changing to dusky brown above, some shades darker throughout than the male antennæ, 14-jointed; thorax as in the male, except that there are two parapsidal depressions, which are hardly to be called grooves; color of wings and venation the same as in the male, legs paler than in the male; abdomen shining black and not distinctly petiolate. Male: length 3 mm.; head black, the ocelli equidistant, breadth of face considerably less than half the width of one eye as seen from the front; antennæ 15-jointed, first and second joints globular, third deeply incised, the remaining ones nearly equal in length, except the very short terminal joint, first joint nearly black at the base, the others yellowish brown but darker toward the tips of antennæ; thorax shining black, with microscopic reticulations, but without grooves or lines, surface of the scutel as on the mesothorax, its foveæ shallow and indistinct; wings clear smoky brown, veins dark and heavy, the second transverse vein, when the wings are closed, on a line with the extremity of the abdomen, cubitus reaching to the first transverse vein, areolet present, the radial area apparently closed by the somewhat thickened border of the wing; legs with the coxæ and trochanters shining black, changing below to yellowish brown, which is the color of the remaining parts, except the posterior pair which are a little darker than the others especially near the body; abdomen shining black, the first segment forming a petiole, which is enlarged in the middle.

The gall of this species is a smooth reddish brown vesicle that grows out from the centre of the buds of the white oak and is surrounded at the base by the bud scales. It is sometimes of a pale greenish brown color, its walls are thin, and the larvæ contained therein are free, that is, they are not enveloped by larval cells. These galls are partially developed in the autumn and in the following spring they mature so rapidly as to make it possible for the insects to emerge about the time the leaves of the oak begin to expand.

N. minutus Bassett.

Female: length 2 mm.; body, except the antennæ and legs, of a very dark brown; antennæ 13-jointed as in the male, except that the joints are shorter and the third joint is straight; the first abdominal segment short, the remaining ones combined not longer than deep. Male: a little longer than the female, with the entire body of a semi-transparent amber color, with a shade of brown on the thorax and on the back of the abdomen; antennæ 14-jointed, the first three points pale amber, the succeeding joints dusky brown, the first joint club-shaped, the second oval, the third curved, but only slightly incised, the remaining joints of nearly equal length; thorax smooth and shining, with bands of dark brown, where the parapsidal grooves would normally be, showing in certain lights in the living specimens, scutel small, smooth and shining, its foveæ wanting, but the furrow separating the mesothorax and scutel broad and deep; wings with a slightly smoky tint, the cubitus reaching quite to the first transverse vein, areolet present, radial area partly closed by the thickened border of the wing; legs of a uniform pale amber color, claws dusky brown; abdomen smooth, shining and petiolate and tapering to a cone-like point at each extremity.

The galls are pubescent, usually of a pinkish color and found on the white oak (*Quercus alba*).

Loxaulus Mayr.

L. mammula Bassett.

Female: length 2 mm.; head yellowish brown, the vertex finely sculptured, face rounded, with a few scattered hairs, and a brush of long bristly hairs on the mentum, tips of the mandibles faintly dusky; antennæ 13-jointed, first joint club-shaped, abruptly truncate, the second regularly ovate, the third and fourth slender, the third a trifle shorter than the two preceding combined, the fourth as long as the first, the first four joints of a uniform clear yellowish brown, while the remaining ones are of a dull dusky brown; thorax dark brown, semitranslucent, the scutel and postscutel almost black, mesothorax smooth and shining except when viewed under a high power which reveals fine rugosities, parapsidal grooves wanting, scutel darker and more strongly rugose than the mesothorax, scutellar foveæ wanting; anterior and middle legs pale yellowish brown, posterior legs much darker; wings hyaline, the first and second transverse and the subcostal vein dark smoky brown, the cubitus disappearing about midway between the two transverse veins; abdomen smooth and shining and apparently black, the first segment one-third longer than the next longest, the remaining segments short. Male: body somewhat shorter than that of the female, and a few shades darker; antennæ 15-jointed, with the first four joints darker than in the female and the remaining ones a little lighter; the legs somewhat lighter than in the female; first segment of the abdomen twice as long as the second in the dry specimens.

The galls of this species are hard woody knots at the base of the young shoots on young white oak trees. They grow from both the lateral and terminal branches and are hemispherical in form and of large size compared with the branch, which always grows out of their summits. They are polythalamous and the larval cells are arranged as though the eggs had been deposited around the bud before the leaves appeared. The white thin-walled larval cells are firmly embedded in the woody tissue. The galls formed around the lateral buds are from 12-18 mm. in diameter, those around the cluster of terminal buds are often 25 mm. in diameter. Sometimes several branches are seen growing out of a single gall instead of one. The galls do not seem to affect the growth of the branches the first year but it seems inevitable that they must injure the branches the following year when the galls decay.

Dryophanta Foerster.

***D. parvula** Bassett.

Female: a little more than 1 mm. in length; mostly black; head a little broader than the thorax; antennæ 13-jointed, the first joint dark, the second globose and as long as the first, the joints beyond the third equal in length, second to eleventh yellowish brown, twelfth and thirteenth dark dusky brown; the median lines which extend two-thirds of the distance from the pronotum to the scutel, the parapsidal grooves and the lines at the base of each wing all smooth and shining; the parapsidal grooves converging closely at the scutel, the latter finely wrinkled or rugose and without foveæ; legs dark, translucent brown; wings hyaline, veins faint, radial area open, areolet wanting; abdomen polished and shining.

The type locality of this species is probably Connecticut; the describer of this species observed it ovipositing in the buds of *Quercus ilicifolia*, 26 May, 1871.

*D. **corrugis** Bassett.

Female: length 2.5 mm.; head black, with very fine reticulations; antennæ 14-jointed, the first joint club-shaped, the second thicker than the first and almost equal in length, the third almost two-thirds as long as the first two, all the joints to the fourth light yellowish brown, the fifth a yellowish to dark brown at the tip, remaining joints very dark brown, the thirteenth and fourteenth separated by an indistinct suture, the former not so dark brown as the joint preceding it; thorax not shining, mesonotum mostly finely, evenly, and transversely wrinkled, scutel more finely wrinkled than the mesonotum and without foveæ; the legs with the femora and tibiæ dark brown except at the joints which with the coxæ and tarsi are yellowish brown, claws simple; wings hyaline, veins pale yellow, almost colorless, areolet wanting and the cubitus so indistinct as to be almost imperceptible even halfway to the first transverse vein, radial area open, the second transverse vein not quite reaching to the anterior edge of the wing and extending posteriorly no further than the point where the areolet would normally be found; abdomen black, polished, somewhat depressed, with the third segment half as long as the second and the following segments concealed in the dry specimens.

The type locality is Waterbury. The original specimens were taken in the spring of the year in the act of ovipositing in the buds of *Quercus prinoides*.

*D. **longicornis** Bassett.

Male: length a little more than 2 mm.; head black; first and second joints of antennæ globose and equal in length, third joint one-third longer than the first two combined, fourth equal in length to the first two, fifth almost equal in length to the fourth, the following joints gradually shorter, and all dark brown; thorax black and shining in that portion which is within the deep parapsidal grooves, median and alar lines wanting, scutel coarsely rugose and with short scattered hairs, foveæ obsolete but replaced by a slight depression, which is rough like the rest of the scutel; legs rather pale red or reddish brown; radial area open, areolet present; abdomen black and smooth.

Type locality: West Rock, New Haven, among the galls of *Andricus exiguus* and *Neuroterus exiguus*.

***D. pallipes** Bassett.

Male: length 2.25 mm.; body mostly black; head finely wrinkled, wider than the thorax, first joint of the antennæ smaller than the second, club-shaped, second globose, both pale, third to fifteenth changing gradually from pale to a dark dusky brown; parapsidal grooves very distinct and closely converging at the scutel, the space between the parapsidal grooves mostly polished and smooth, scutel rather coarsely rugose and without foveæ; legs very pale brownish yellow; wings subfuscous, veins reddish brown, radial vein ending very abruptly within the margin of the wing, areolet distinct, cubitus reaching to the first transverse vein; abdomen petiolate, compressed, and shining black. Female: antennæ paler and the joints thereof shorter than in the male.

The galls of this species are simply a larval cell at the centre of clusters formed in the rapid spring growth of the thrifty young white oak shoots. The gall is blackish brown, has a thin shell, and is oblong oval. It reaches a length of slightly over 2 mm. and is 1.5 mm. in diameter. The adult emerges from the apex of the cell in such a way as to leave the gall resembling an egg shell with the end removed.

Type locality: Waterbury.

***D. ignota** Bassett.

Female: length nearly 2 mm.; head black, finely rugose; antennæ 13-jointed, the first and second joints dusky yellowish brown, the remaining ones from dull dusky brown to dark brown; thorax microscopically sculptured or striate, the striæ apparently transverse though not so over the entire surface, parapsidal grooves present, other impressed lines wanting, scutel finely rugose and without foveæ; legs clear testaceous, the posterior pair darkest, especially the femora; wings slightly dusky, veins pale, areolet bounded by almost transparent veins, radial area open; abdomen black, sheath of the ovipositor dusky testaceous at the tip.

The gall of this species consists of an oval cell occurring either singly or in clusters of from two to eight on the under side of the leaves of *Quercus bicolor*. The galls are sessile and situated on the midrib and principal veins, and usually lie in a position nearly parallel to the surface of the leaf. They are at first covered with short woolly hairs, but when ripe become more or less denuded. They measure 2.5 mm. in length and 1.2 mm. in diameter and resemble very closely the cocoons of some species of *Microgaster*.

New Canaan, 17 September, 1915 (B. H. W.).

°**D. polita** Bassett. Polished Oak Gall.

Female: length nearly 3 mm.; head apparently black, but of a very dark reddish brown when seen in certain lights, cheeks somewhat lighter than the other parts, vertex reticulate, antennæ black, 14-jointed, the first joint club-shaped, the second oval or ovate, the third as long as the first two combined, the fourth one-fourth shorter than the third, the remaining joints except the apical one subequal, the last joint a little longer than the preceding; thorax black and smooth, with two parapsidal grooves, between which are two parallel depressions that reach from the pronotum two-thirds of the distance to the scutel; few scattered hairs on the thorax, the highly polished pleuræ bordered with scattered white hairs, scutel finely wrinkled and rounded posteriorly and projecting over the metathorax, its foveæ widely separated and shining; legs very dark reddish brown, a little lighter at the sutures; wings hyaline, cubitus pale, radial area open; abdomen black and polished, its pedicel more than half as long as broad, sheath of the ovipositor slightly projecting and tipped with a few long yellowish hairs.

The galls are round, monothalamous, common in midsummer on both surfaces of the leaves of *Quercus obtusiloba*, at or near the summit of the young shoots, with from one to fifteen or twenty on a single leaf. They range in size from 6 to 18 mm. in diameter, and when fully matured are of a paler shade of green than the leaf on which they have grown, except where exposed to sunlight, in which case they become red or brown. The point of attachment is so small that upon removing them there is hardly any trace left of their having been attached to the leaf stem. The shell of the gall is, when dry, very thin and brittle, and the single round larval cell is kept in a central position by fine radiating and branching fibres that extend from the cell to the outside shell.

***D. papula** Bassett.

Female: length 2 mm.; head dark reddish brown, with a few white hairs on the posterior edge of the vertex, vertex finely punctate; antennæ brownish red, darker toward the tip, 13-jointed, the last three joints connate so as to form a rather heavy club; thorax black, lustreless, sparsely covered with hairs, with faint parapsidal grooves converging slightly where they approach the scutel, a very faint median line discernible from the posterior part of the mesothorax and extending one-third the distance to the pronotum, foveæ present on the scutel but indistinct; legs reddish brown; abdomen shining black, sheaths of the ovipositor yellow, the ovipositor yellowish brown with the exserted portion at least five times as long as the body.

The gall of this species is monothalamous and quite often found in clusters of from forty to one hundred. The individual galls are papillous or cone-like and project unequally. They are usually so crowded as to form a confluent mass with pustule-like elevations. They are very hard though only transformed portions of the blade of the leaf. On the under side of the leaf they appear simply as a scar, projecting little if at all. They resemble the galls of *Andricus futilis* and occur on the leaves of *Quercus rubra* and *Q. tinctoria*.

Type locality: Derby.

***D. pedunculata** Bassett.

Female: length 2 mm.; head black, vertex minutely rugulose: antennæ 14-jointed, first and second joints equal in length and very pale yellow, the third a little longer than the two preceding combined, the fourth equal to the first and second united, and brownish at the tip, the remaining joints dark brown and equal in length; thorax smooth, microscopically punctate, black and shining, with parallel lines obscure but with distinct parapsidal grooves, scutel obscurely punctate, its foveæ indistinct; legs yellowish brown, middle of the femora darker, claws simple; wings hyaline, veins dull brownish yellow, cubitus reaching nearly to the first transverse vein, radial area open; abdomen bright shining black, with the second segment concealing the following ones in dry specimens. Male: body slightly longer than in the female; antennæ 15-jointed, the first joint dark at the base, the second yellow, globular, base of the third yellow, its tip thickened, remaining joints dusky brown; head, thorax and abdomen black; legs slightly darker than in the female.

The galls of this species grow on slender peduncles on the edges of the leaves of *Quercus rubra* and *Q. coccinea*. They are ovate with a long curved point, 3 by 4 mm. in dimensions exclusive of the tip and the peduncle, which latter is from 6 to 12 mm. in length and is evidently the prolongation of the lateral leaf veins. When fresh the gall proper is smooth and has a somewhat glaucous hue which mostly disappears in drying, at which time there is a change to a dark, dirty, olive brown color. The larval cell, which is free, smooth and oval, is 1 by 2.5 mm. in dimensions.

Type locality: Waterbury.

Holcaspis Mayr.

H. globulus Fitch. Oak Bullet Gall. Pl. vi, Fig. 4.

Female: length 5 to 6 mm.; mostly black; head, thorax, and abdomen except the hind margin of the second segment, densely covered with whitish pubescence; antennæ 14-jointed and black; wings with distinct veins, radial area not closed; abdomen minutely punctate. Galls occur on the young shoots of *Quercus montana*, *Q. alba* and other oaks, in recently cut woodlands.

Waterbury (Bassett); New Haven, 27 May, 1907 (B. H. W.).

***H. rugosa** Bassett.

Female: length 4 mm.; antennæ dark brown, 14-jointed, first joint club-shaped, second broader than long, third longer than the first two combined, fourth as long as the first two, the four following gradually shorter, the ninth and following equal in length; thorax covered with short appressed yellowish white hairs which nearly hide the punctate surface, mesonotum with a number of parallel lines beside the parapsidal grooves to which all the additional lines are also parallel and equidistant; legs dark reddish brown; wings hyaline, veins blackish brown and quite distinct, the subcostal and second transverse veins darkest, areolet present, cubitus reaching only half-way from the areolet to the first transverse vein, veins enclosing the open radial area terminating abruptly before reaching the margin of the wing; abdomen black and shining, the first segment equal in length to all the rest and covered with white hairs on the side beneath the wing, sheath of the ovipositor dark yellowish brown.

The galls of this species are round, hard, and sessile on the branches of *Quercus prinoides*. They measure from 12 to 16 mm. in diameter; their surface when immature is smooth and often quite red on the side exposed to the sun. When fully ripe or matured they have a shrunken and shriveled surface, and their color varies from ashen to dull brown. The free larval cell is surrounded by a yellowish brown cellular mass that is denser than a sponge and fills the entire space between the cell and the outer wall.

***H. fasciata** Bassett.

Length 4.5 mm.; head yellowish brown, face smooth, shaded lighter than the cheeks and vertex; antennæ dusky brown throughout, 14-jointed with the joints rather indistinctly separated, second joint oval, the third a little longer than the first and second combined, the remaining joints of a uniform red; thorax shining and almost black, parapsidal grooves deep, scutel very coarsely wrinkled and corrugated, its foveæ not distinct; legs brownish red; wings subhyaline, with the veins rather distinct, with an areolet, an open radial area, and the cubitus reaching to the first transverse vein; abdomen greater in extent from its dorsal to its ventral surface than usual.

The galls of this species were found in September on the summer growths of *Quercus ilicifolia*. They are arranged in linear clusters near the tips of the shoots, somewhat after the manner of the following species. While growing they are mottled light and dark green, these spots often being arranged in broad bands or fasciæ. At the time of maturity they range from 6 to 12 mm. in diameter. At this time they are almost exactly round. Finally they drop to the ground in response to the slightest touch and change then in color to a dull black.

***H. duricoria** Bassett. Pointed Bullet Gall.

Female: length 5 mm.; almost entirely black; antennæ 13-jointed, first and second joints together hardly longer than half the length of the third, third to ninth joints gradually shorter and each larger at the apex than at the base; thorax hairy, with parapsidal grooves extending from the scutel forward but disappearing before reaching the pronotum; in addition to these grooves two parallel lines extending from the pronotum to the middle of the mesonotum, and a median line beginning at the border of the scutel but not extending far forward, the line above the base of the wing distinct and deepest at the scutel, which latter is hairy and without foveæ; wings slightly smoky, areolet present, cubitus disappearing before reaching the first transverse vein, the second transverse vein heavy, especially at the base of the open radial area; legs dark brownish red, the claws bidentate; abdomen black and shining.

The galls of this species are globular, sessile and subclasping on the young branches of *Quercus bicolor.* In form they are somewhat like the Minié rifle balls. The galls are often so densely crowded that they become misshapen. Their surface is finely pulverulent and very hard and dry. The type locality is Waterbury, where females were observed emerging in October and November and were eaten by English sparrows and other small birds as fast as they appeared.

Midway, 16 April, 1906 (B. H. W.); New Haven, 25 August, 1906 (P. L. B.).

Cynips Linnæus.

C. strobilana Osten Sacken. Pine Cone Oak Gall.

Female: length 4-5.5 mm., mostly dark brown, with dense appressed pubescence on the thorax and along the hind margins of the abdominal segments; legs mostly brown, anterior knees and tarsi reddish; wings hyaline; head black, punctate and pubescent, palpi reddish, antennæ 14-jointed, third joint about as long as the first and second combined, the fourth to sixth gradually decreasing in length, the seven penultimate joints nearly as long as broad, the last joint somewhat longer than the preceding but not as long as the two preceding combined; thorax with its pubescence yellowish, not sufficiently dense to entirely conceal the sculpture, which latter consists of a rather dense punctuation and shallow grooves, two of which extend from the pronotum backward and end about the middle of the mesonotum in a smooth flat expansion; pleuræ black, punctate except a smooth shining spot in the middle, with their lower part pubescent; scutel punctate above, rugose behind and finely pubescent, pits at its base of moderate size; the legs dark brown, pubescent, the base of the femora and the knees and tarsi of the anterior pair reddish, in some individuals in addition a reddish tinge at the base of the femora and on the knees of the posterior pair; wings hyaline, the second transverse vein forming a knee which bears a distinct stump of a vein in its middle; abdomen pitch black, in some individuals, however, slightly reddish below along the hind margin of the segments, its entire surface except the base of the segments and a narrow smooth line along the back clothed with a whitish appressed pubescence, under which latter there is a moderately dense perceptible punctuation, the second and largest segment of the abdomen hardly extending to its middle.

Waterbury, on leaves of swamp oak; Greenwich, 24 September, 1915 (M. P. Zappe).

C. confluens Harris. Oak or May Apple.

Length nearly 6 mm.; head and thorax black and roughened with numerous little pits and short hairs, body posteriorly smooth and of a shining pitch color; legs dull brownish red; anterior wings with brown spot near the middle of the outer edge.

The galls of this species are said to be the largest of the so-called oak apples. They grow on the leaves of the red oak, are round and smooth, and measure from 37 to 50 mm. in diameter. At first the gall is green and somewhat pulpy, but when mature it consists of a thin brittle shell of a dirty drab color which encloses a quantity of brown spongy material in the centre of which is a single cell about the size of a pea, which cell is the final home of the larva and chrysalis. The adults emerge probably as a rule in the spring, but they have been noticed to come out in the fall.

New Haven, 4 June, 1908 (B. H. W.).

Amphibolips Reinhard.

***A. verna** Bassett.

Female: length 4.5 mm.; head rugose, dusky black; antennæ concolorous with the head, 14-jointed, with the first joint twice as long as the second, third a little longer than the first and second combined and very slightly curved, the fourth two-thirds and the fifth one-half as long as the third, the sixth to the thirteenth equal in length, the apical joint half as long as the preceding one; thorax rugose and thinly covered with short hairs, the parallel lines of the mesonotum extending more than half-way to the scutel, parapsidal grooves quite obscure, the impressed lines over the bases of the wings more apparent than the parapsidal grooves, scutel with foveæ that are not smooth; legs uniformly dark red; wings subfuscous, veins brownish red, radial area open, the areolet large and nearer to the anterior border of the wings than in most species, cubitus reaching to the first transverse vein; abdomen shining and microscopically punctate.

Type locality: Waterbury. Found ovipositing in the buds of *Quercus ilicifolia*, 9 April, 1897.

A. badia Bassett.

Female: length 6 mm.; mostly dark brownish red; head and thorax covered with short appressed red hairs; antennæ 13-jointed, second joint globular, the third one-third longer than the two preceding combined, the fourth one-third shorter than the third, the fifth and sixth gradually shorter, the third to sixth larger at the apex than at the base, face covered with appressed hairs, obscure converging line extending from the base of each antenna to the mouth, head not broader than the thorax; prothorax anteriorly with a very narrow shining band, mesothorax finely and evenly but rather sparsely punctate, parapsidal grooves and other lines rather obscured by the short, dense and closely appressed hairs, which completely hide the parapsidal grooves posteriorly, scutel rounded and slightly elevated posteriorly, foveæ almost obsolete; legs darker than the thorax and densely covered with short, fine and appressed hairs; wings dark smoky brown, veins almost black, areolet well defined, cubitus disappearing a short distance from the first transverse vein; abdomen black and shining, the second segment concealing nearly all the others above, but its length beneath less than half its length above, the sides of this segment covered with a dense patch of reddish hairs.

Type locality of this species is probably Connecticut. It has been taken early in spring.

***A. ilicifoliae** Bassett. Scrub Oak Gall.

Female: length 4 mm.; mostly black; vertex of the head and the entire thorax black, deeply and irregularly sculptured; face rugose and pubescent, with the hairs converging toward the mouth, palpi shining reddish brown, antennæ 13-jointed, the apical joint with an imperfect suture apparent on the inner side, first and second joints shining black, the remaining ones pubescent and dull black; thorax pubescent, the parapsidal grooves obliterated by a coarse, somewhat linearly arranged sculpture, scutellar foveæ sculptured like the rest of the scutel; legs with their coxæ and the upper part of the femora of the anterior and middle pairs black, rest of the anterior and middle pairs reddish brown, posterior pair black, reddish at the joints; wings slightly dusky, veins brownish black, areolet very small, vein at the base of the open radial area covered by a large brownish black cloud, which covers part of the areolet but does not reach to the anterior margin of the wing, in some individuals in addition a light brown cloud in the basal cell; abdomen black and shining, except the ventral edge, which is clear brownish red. Male: length 3.5 mm.; differs from the female in having 15-jointed antennæ, and in the darker legs, the posterior pair of which, including the tarsi, are almost entirely black.

The galls of this species measure as much as 50 mm. in length and 21 mm. in diameter, though the average size is more nearly 43 mm. for the length and 18 mm. for the diameter. They are elongated, fusiform, erect or nearly so, apparently growing out of the petiole of the leaves of *Quercus ilicifolia* and from the upper side of the petiole. Their apex is rather long and more slender than the basal portion and often considerably curved. The central space containing the larvæ is kept in place by radiating woody fibres. The advent of the gall sometimes entirely prevents the development of the leaf on the upper side of which it has formed.

Type locality: Waterbury.

°**A. prunus** Walsh. Acorn Plum Gall.

Female: length 5-7.5 mm.; mostly black; head rather coarsely rugoso-punctate, face pubescent, antennæ 13-jointed, the apical joint as long as the eleventh and twelfth combined; thorax opaquely and coarsely rugoso-punctate, with the dorsal groove extending only one-third the way to the scutel and with the parallel carinæ on each side of the above groove extending only half-way to the scutel, scutellar foveæ large and deep, highly polished and separated only by an acute and high carina; legs, including the coxæ, rufous, with the trochanters and tips of the tarsi black; wings subhyaline, with a dark brown cloud extending from the first transverse vein over the areolet and the radial area to the tip of the wing, veins all brown and distinct, but neither the subcostal, radial, cubital nor anal veins attaining the exterior margin; abdomen with the second joint polished and with some sparse shallow punctures upon the basal three-fourths of the same. The terminal fourth of the second segment except the extreme edge is so densely covered with small confluent punctures as to appear like virgin silver.

The galls occur on the side of the tuft of the acorns of *Quercus rubra* and *Q. tinctoria*. They are globular, smooth and plum-like, intensely bitter, and about 12.5-19 mm. in diameter, mottled with yellowish and crimson outside, internally yellowish in the centre, and pink toward the circumference. This gall reaches maturity in August and September.

A. cœlebs Osten Sacken. Oak Spindle Gall.

Male: length 4 mm.; head and thorax black, opaque, deeply rugose, the latter pubescent; antennæ reddish brown, paler toward the tip, 15-jointed; legs mostly ferruginous yellow, posterior femora and tibiæ infuscate; wings with a brown spot on the second transverse vein, and a pale, almost obsolete, brownish shade between it and the anal angle of the wing, the subcostal and radial veins interrupted before reaching the anterior margin, areolet indistinct, second transverse vein angular.

The galls of this species occur on the red oak (*Quercus rubra*), and are elongated, fusiform, pale green, with pedicel inserted on the edge of the leaf and forming the prolongation of a leaf vein. The length of the gall is about 25 mm.

New Haven, 22 February, 1911 (B. H. W.).

A. inanis Osten Sacken. Empty Oak Gall.

Female: head black, deeply and irregularly sculptured on the front and vertex, face pubescent, rugose; antennæ 13-jointed, brown or reddish brown, especially toward the tip; thorax black, sculptured somewhat like the vertex and sparsely pubescent, three deeper longitudinal furrows occurring among the rugosities and converging toward the scutel; near the anterior end of the intermediate furrow and parallel to it, smaller rather indistinct longitudinal furrows and ridges; pit at the base of the scutel divided by a longitudinal ridge; legs reddish yellow, pubescent, hind tarsi sometimes infuscated, claws black; wings with a brownish black spot at the base of the radial area extending beyond the second transverse vein but not to the anterior margin of the wing; abdomen brownish red and glossy.

On leaves of scarlet oak.

New Haven, September, 1906 (W. E. B.).

°**A. nubilipennis** Harris.

Very like *Synergus oneratus*, from the dark colored variety of which it differs only slightly in size, being a little larger, and in the smoky cloud on the tips of its wings, which gives this species its name.

The galls of this insect are of the size and color of grapes and occur on the leaves of oaks. They contain a solitary grub which completes its transformations in June in the state of Massachusetts.

***A. sculpta** Bassett.

Female: length 5 mm.; head black, irregularly and coarsely sculptured; face sparsely pubescent; antennæ black, 13-jointed, first and second joints very short, the third joint longer, the remaining joints gradually decreasing in length to the thirteenth, which latter equals the eleventh and twelfth combined; thorax black, sculptured somewhat like the head, pubescent; legs honey-yellow, coxæ black, tarsi brownish; wings smoky brown, somewhat cloudy, veins dark red, terminating rather abruptly before reaching the margin of the wing, areolet distinct, radial area with its sides almost parallel; abdomen black, microscopically punctate, the second segment hairy beneath the wings. Male: length 4 mm.; antennæ 15-jointed, third joint rather deeply incised; legs mostly dark reddish brown, the posterior pair nearly black, all rather lighter at the articulations than elsewhere; wings, including the veins, hyaline, the latter seen but faintly and then only in a very favorable light. The difficulty with which the veins can be seen may be due to the fact that the specimens upon which this description is based may have been immature.

The galls of this species were found attached to the under side of the leaves of *Quercus rubra*. These galls are globular, varying in size from 6 to 18 mm. in diameter. They are in color like a white grape, sour to the taste, succulent, of the consistency of a green grape, and sufficiently translucent to enable one to make out the single cell in the centre by simply holding the gall up to the sunlight.

Type locality: Waterbury.

Andricus Hartig.

***A. ventricosus** Bassett.

Female: length 3.5 mm.; head and thorax bright cinnamon color, the former finely punctate, face pubescent, dark brown around the mouth, tips of the mandibles black, palpi pale brown, antennæ 15-jointed, third joint longest, the other joints gradually decreasing in length to the apical one, which is as long as the two preceding combined and provided with a connate suture; thorax punctate somewhat like the head, parapsidal grooves present, the line dividing the mesonotum lengthwise reaching from the pronotum to the scutel, on each side of this medial line a line reaching half-way from the collar or pronotum to the scutel, also a deep linear depression on each side over the base of the wings: legs mostly yellow, tips of the tarsi black; wings hyaline, the subcostal, anal, first and second transverse veins dark reddish brown, the first two rather paler toward the base, areolet distinct, radial area open, the vein forming its base considerably enlarged; abdomen darker brown than the thorax.

The galls of this species grow in clusters of from three or four to a dozen on the limbs and occasionally on the trunks of young shrubs of *Quercus ilicifolia*. They are cone-shaped, truncate at the base, with the apex often prolonged into a slender recurved point, from 12 to 15 mm. long and from 6 to 9 mm. in diameter at the base. When quite fresh or immature they are often of a deep red color, which turns to brown or black when the galls become dry. Finally, the galls are very hard and enclose a nearly free larval cell.

Type locality: Waterbury.

***A. formosus** Bassett.

Female: length 3 mm.; head black, finely and evenly rugose; antennæ 15-jointed, yellowish red, the terminal joints darker, suture between the fourteenth and the fifteenth joints as distinct as the preceding ones, face with a short pubescence, the hairs of which converge toward the mouth, mandibles black, palpi of a color similar to that of the antennæ; thorax black, with a few short hairs on the pronotum, mesonotum with distinct parapsidal grooves and a median line which is broad where it ends at the scutel but gradually decreases and disappears just before reaching the pronotum, in addition between this and the parapsidal grooves two short lines beginning at the pronotum and extending half-way to the scutel; the thorax reticulate, almost umbilicately punctate, scutel finely rugose, its foveæ smooth and shining; legs bright brownish red, except the upper part of the femora, which is nearly black, and the coxæ, which are entirely black; wings hyaline, as are the veins, except the first and second transverse and the subcostal, which are very pale yellow, areolet equiangular, bounded on the inner side by an entirely colorless vein, radial area open; abdomen bright reddish brown, minutely punctate, sheath of the ovipositor dark brownish red.

The galls of this species were found in a cluster of forty or fifty elongate, ovate, individual galls on a branch of a young red oak tree. They were from 18 to 25 mm. in length and 12 mm. in diameter in the middle, tapering to a point at both ends, covered with a short velvety pubescence, and when dry they were ridged like a cantaloupe. The inner structure, of a cork-like nature, adheres closely to the larval cell and is divided lengthwise into many parts by partitions corresponding to the outside ridges. This gall is monothalamous and the cell is 2.5 mm. long.

Type locality: Waterbury.

***A. pruinosus** Bassett.

Female: length 2.5 mm.; mostly shining black; antennæ 13-jointed, first and second joints light brown, all the following gradually shorter to the apex which is dusky brown, in some cases a faint suture on the apical joint; thorax subcompressed from side to side, punctate and with a few scattered hairs, the two median lines and the parapsidal grooves all even and distinct, scutel microscopically wrinkled and with shining foveæ; legs dark translucent brown, paler at the joints and tarsi than elsewhere; wings subhyaline, veins distinct in the basal portion of the wing but hardly noticeable beyond, radial area open, areolet bounded above by a longer vein than the others surrounding it, the cubitus reaching half-way to the first transverse vein; abdomen with its second segment almost tubiform and covering all of the following segments in the dry specimens.

The galls of this species are 3 to nearly 4 mm. in diameter, perfectly round, and to be found at various places on the leaves and occasionally on the sterile aments of *Quercus obtusiloba.* They are pruinose and their walls are very thin and do not enclose a larval cell. In many instances the blade of the leaf or the part affected by the gall is reduced to a mere rudiment of irregular form and varying size, but in such cases the gall is always banded by a minute ridge answering to the leaf blade. It bears a close resemblance to *A. utriculus* Bassett.

Type locality: East Rock, New Haven.

A. perditor Bassett.

Head, antennæ and legs deep brownish red; head finely punctate; mesothorax darker than the head and scutel; antennæ 14-jointed, first joint ovate, second subquadrate, third and fourth nearly equal; parapsidal grooves very slender and subobsolete in front, lines at the bases of the wings present but indistinct, scutel ending in a blunt rounded point, rugose and hairy and with rather widely separated foveæ; legs light brown at the joints; wings with their veins dark brown, areolet wanting, radial area open; abdomen black and polished, the second segment three-fifths as long as the entire abdomen.

The galls of this species are 3 to nearly 4 mm. long and 2.5-3 mm. broad. The base is broad, the apex conical, the base with the cicatrix of a true acorn. They occur in among the acorns of *Quercus ilicifolia* in the spring of the acorns' second year's growth, at which time the latter are very like these galls in appearance.

***A. petiolicola** Bassett. Oak Petiole Gall.

Female: length 2.5 mm.; vertex of the head black, nearly smooth, face brown and pubescent, the mouth parts lighter in color, antennæ reddish brown, 13-jointed, the terminal joints darker in color than the basal; thorax rugulose, longitudinal grooves two in number, converging toward the scutel, and flanking two shorter grooves reaching half-way from the pronotum to the scutel, an indistinct groove over the base of the wings, scutel wrinkled and with a few scattered hairs, its base provided with foveæ; legs light brown, the posterior pair dark brown, tips of tarsi very dark brown or black; abdomen black and polished, its ventral portion, however, dark reddish brown, its second segment half the length of the abdomen; radial area not closed, cubitus disappearing before reaching the first transverse vein. Male: length 2 mm.; antennæ 15-jointed, the third joint incised; abdomen black, the second segment three-fourths as long as the remaining ones; otherwise as in the female.

The galls of this species occur on *Quercus montana*, are club-shaped, situated on the petioles of the leaves, 12.5 mm. in diameter, hard and woody when mature.

Type locality: Waterbury. New Haven, 8 October, 1908 (W. E. B.).

***A. ostensackeni** Bassett.

Female: length 3 mm.; mostly black; head and thorax irregularly sculptured; face sparingly pubescent, palpi brown, antennæ pale brown, 13-jointed; thorax with a few scattered hairs, longitudinal lines broken by the sculpture and only indistinctly traceable, mesothorax along the posterior margin bounded by a salient black shining ridge; wings with a faint tinge of brown, veins brown and distinct, cubital vein disappearing before reaching the first transverse vein; posterior legs very dark and shining brown, all the others somewhat reddish brown and lighter at the joints than elsewhere; abdomen black and shining. Male: length 2.5 mm.; antennæ 15-jointed, dull dark brown; legs darker than in the female; abdomen elongated, with the third joint nearly two-thirds its entire length; otherwise like the female.

Galls of this species are somewhat rounded, oblong, hollow, pale greenish yellow, occur on the under side of the leaf, project slightly on the opposite side and contain an oblong kernel kept in position by filaments radiating toward the outer shell.

Type locality: Waterbury.

***A. cicatricula** Bassett.

Female: length 2.5 mm.; head and thorax practically as in the male; antennæ 13-jointed, abdomen shining black, except beneath, where it is clear translucent brown, sheaths of the ovipositor extending above the dorsum; legs all dark reddish brown; wings as in the male. Male: length nearly 2 mm.; head black, vertex microscopically netted, antennæ 15-jointed, first and second joints dark reddish brown, remainder light yellowish brown, shining, first joint heavy, second ovoid, third one-fourth longer than the first two combined and slightly curved but scarcely incised, fourth to fourteenth subequal, and each as long as the first and second combined, apical joint conical; thorax black and shining, mesothorax rounded and with regular transverse reticulations, two faint parallel lines present, parapsidal grooves entire and almost parallel, converging only slightly toward the scutel, which is finely rugose and has foveæ that are shining; legs with the posterior pair dark brown and with pale sutures, the anterior and middle pairs light reddish brown, claws with two teeth; wings hyaline, first and second transverse and submarginal veins brown, the remaining veins entirely or almost entirely colorless, areolet present, radial area open, cubitus becoming obsolete halfway toward the first transverse vein; abdomen with its second segment nearly round, polished and black, only the edge of the remaining segments visible.

The galls of this species are polythalamous, occur on the midvein of the leaves of *Quercus alba,* one to a leaf, are situated at times at the base but usually from one-fourth to one-half the way beyond the base, rarely above the middle, project one-third below and two-thirds above the surface of the leaf, and are rounded on the under and cone-shaped on the upper surface of the leaves. The gall is solid and somewhat fibrous, its shortest diameter measuring 12.5 mm. and its longest diameter from 15 to 21 mm. The larval cells radiate in all directions from the centre of the gall and are quite numerous. There is at or near the centre of the cone a small scar or indentation which is invariably present.

***A. corniger** Osten Sacken. • Horned Knot Oak Gall.

Female: length nearly 3 mm.; mostly black; head as broad as the thorax, face finely and indistinctly pubescent, irregularly rugose, subopaque, with a few indistinct striæ converging toward the mouth on both sides, mandibles reddish, their tips black, palpi brownish yellow, front opaque, vertex with a kind of lustre, irregularly sculptured, antennæ 14-jointed, yellowish brown, brown toward the tip, third joint nearly as long as the two preceding combined, the following joints gradually diminishing in length, joints eight to thirteen but slightly different in length, the apical joint about one and one-half times the length of the preceding; humeral parts of the pronotum coarsely rugose, opaque in contrast to the comparatively smooth and shining mesonotum, the latter with dense transverse microscopic rugæ, which do not materially diminish the lustre of the surface, three distinct impressed lines running from the pronotum some distance backward, parapsidal grooves distinct, their margins less well cut or less smooth than usual, appearing as if the grooves were formed by a series of confluent punctures, the lateral grooves with similar characters and somewhat curved with the convexity on the outside, tegulæ yellowish brown, pleuræ densely irregularly sculptured, opaque, except a shining spot on their upper portion, scutel rugose; legs mostly brownish yellow, tips of tarsi brown, hind femora and tibiæ infuscated, middle femora in some cases also infuscated; wings hyaline, somewhat whitish, distinct veins of pale brownish color, areolet distinct.

Gall occurs on pin oak (*Quercus palustris*) on the limbs of which the woody knots bear pale yellow conical projections, which constitute these galls.

Type locality: Waterbury. Saugatuck, 29 March, 1915 (Andrew Westlin).

***A. incertus** Bassett.

Male: length 3 mm.; head black, antennæ 14-jointed, the first joint shining black, clavate, the second ovate, the third half as long as the first and second combined, the fourth equal in length to the third, the succeeding joints subequal, becoming shorter and shorter, the joints beyond the first dark brown; thorax black, roughened and hairy, two parallel lines extending half-way from the pronotum to the scutel, additional lines two in number extending half way from the scutel to the pronotum and diverging, a line over the base of each wing, these lines rather obscured by the pubescence, scutellar foveæ almost as lustreless as the scutel itself; legs dark shining brown, nearly black, but somewhat lighter at the joints; wings hyaline, with a smoky brown spot toward the base, areolet present, radial area open; abdomen black and shining, its first segment (above) two-thirds the length of the abdomen as a whole. Was found ovipositing, 22 April, 1890, in buds of *Quercus bicolor*.

The type locality for this species is probably Waterbury.

***A. obtusilobæ** Bassett.

Female: length 2.5 mm.; head, antennæ and legs clear yellowish red; antennæ 13-jointed, the first joint club-shaped, the second half as long as and the third equal to the first in length, the following joints each shorter than the next preceding, except the apical joint, which is twice as long as the twelfth; head broader than the thorax, vertex evenly and finely wrinkled or punctate; thorax with the surface of the mesonotum punctate, and traversed in part by two parallel median longitudinal lines extending halfway from the pronotum to the scutel in addition to the parapsidal grooves which are present but indistinct, scutel finely wrinkled, its foveæ smooth; wings not quite hyaline, their veins faint, radial area open, areolet wanting, cubitus reaching two-thirds the distance to the first transverse vein; abdomen polished.

The type locality of this species is also probably Waterbury.

***A. piperoides** Bassett.

Female: length 3.5 mm.; head microscopically punctate, antennæ 14-jointed, first joint ovate, the third one-third longer than the first and second combined, the fourth to the seventh successively shorter than the next preceding, the joints beyond the seventh ovate; thorax smooth and shiny, mesonotum with distinct parapsidal grooves, scutel subquadrate, finely wrinkled, its foveæ distinct, the carina small, extending to its posterior margin; legs less dark than the rest of the body, which is almost entirely dark reddish brown; wings with distinct veins, areolet obsolete or nearly so, reduced to a light spot at the crossing of the distinct veins, cubitus extending almost to the first transverse vein, radial area open, its basal vein terminating abruptly at a distance from the costal border; abdomen compressed from side to side, giving the dorsal and ventral portions a sharp edge, almost entirely bare, a few hairs on the sides of the penultimate segment.

The galls of this species measure from 3 to 9 mm. in diameter, and occur in dense clusters along the midvein of only the largest grown leaves of the thriftiest shoots of young red oaks (*Quercus rubra*). These clusters contain from one or two dozen galls up to one hundred or more and extend along the vein of the leaves to the distance of 7 or 10 cm.

This species was probably described from specimens collected in Waterbury.

***A. pulchellus** Bassett.

Female: length 2.5 mm.; black and glistening; antennæ 14-jointed, dark reddish brown, first joint globose, the third and following joints of uniform length; thorax ovate, punctate, sparsely hairy, parapsidal grooves closely converging toward both the pronotum and the scutel, the foveæ of which latter are shining; legs clear reddish brown; wing veins pale brown, radial area open, areolet bounded by veins of uniform size, cubitus indistinct and reaching half way to the first transverse vein; abdomen short, its first segment equal to four-fifths of its entire length, black and smooth.

The specimen from which this species is described was found ovipositing in the buds of *Quercus prinoides*, and was probably collected in Waterbury.

***A. patiens** Bassett.

Female: length 3 mm.; head very dark red, hairy and rugose, vertex flattened, antennæ 14-jointed, the first joint dark and club-shaped, second joint one-third the length of the first and somewhat lighter in color, third equal to the first and second combined, fifth a little shorter than the fourth, and the sixth a little shorter than the fifth, the succeeding joints equal in length, all of the joints except the first dusky red or coppery; thorax and scutel dull red and covered with hair, parapsidal grooves, median lines and lines near the bases of the wings all present, the median lines reaching about one-third the distance from the pronotum to the scutel, scutellar foveæ present, not smooth and shining; wings faintly fuscous, the larger veins pale red, the smaller almost colorless, radial area open and broadest in its middle, areolet present, the anterior sides bounded by indistinct veins; abdomen black and smooth, its first segment with a few scattered hairs on its anterior half; legs semi-translucent red, posterior femora almost ovate in the middle, claws dark.

This species was found ovipositing in the buds of *Quercus ilicifolia* early in the spring. The type locality is probably Waterbury.

A. fusiformis Osten Sacken.

This species differs from *petiolicola* as follows: The two lines between the parapsidal grooves are distinctly impressed and very like furrows, but have less lustre and are therefore not as perceptible as in the species above mentioned. In addition to these lines there is a third intermediate impressed line that is perceptible in certain lights, the scutel is less deeply wrinkled, and the thoracic pubescence is more distinct than in the other species.

The gall of this species is elongated, fusifiorm, petiolate, and mostly occurs on the margin, though sometimes on the surface, of the leaf of the white oak (*Quercus alba*).

***A. exiguus** Bassett.

Female: head black, antennæ 13-jointed, joints three to ten, in dry specimens shrunken and wrinkled; wings not clear, veins distinct. Male: head black, antennæ pale yellow, 14-jointed, second joint globular, the third as long as the first and second combined, and subclavate, the succeeding joints equal in length and not quite as long as the third, except the apical joint, which is minute, the tenth to thirteenth joints slightly dusky; thorax shining yellow, parapsidal grooves distinct, scutel yellow, slightly rugose, boŭnded posteriorly by a heavy ridge, its foveæ round and close together; legs pale yellow; wings subhyaline, veins pale brown, areolet present but faint, radial area open, cubitus reaching three-fourths of the distance to the first transverse vein.

Type locality: West Rock, New Haven. Found among the dry but still adherent aments of *Quercus obtusiloba* in June.

***A. ashmeadi** Bassett.

Female: length 3.5 mm.; thorax with distinct parapsidal grooves that are even throughout, the intermediate parallel lines not grooved and reaching only half-way to the scutel, a faint line on the mesonotum near the base of each wing, thorax irregularly punctate, scutel more coarsely so than the rest of the thorax, and more hairy; wings clear, veins distinct and brown, areolet present, radial area open, cubitus not quite reaching the first transverse vein; legs very dark reddish brown, almost black, except at the joints, claws simple; abdomen polished, shining black, except where covered with white hairs, the dorsal and ventral portions of the second, third and fourth abdominal segments bare.

The type of this species was probably found in Waterbury, and is represented by a specimen collected 13 April, 1890, ovipositing in the buds of *Quercus bicolor.*

***A. operatola** Riley and Bassett.

Female: length 3.5 mm.; head, including the antennæ, and thorax, including the legs, dark reddish; head almost crescent-shaped, very finely rugose, antennæ 13-jointed, first joint dark, second joint globose and only one-third as long as the first, third not quite as long as the first and second combined, the fourth to the twelfth successively with each one shorter than the next preceding, the apical joint tapering at its apex; thorax punctate, parapsidal grooves as well as the two intermediate lines present, the latter extending little more than half-way to the scutel and posteriorly somewhat divergent, mesonotal lines near the insertion of the wings distinct, except for minute hairs which somewhat obscure the same, as well as the punctuation of the thorax, scutel roundish, somewhat rugose and more hairy than the rest of the thorax, its foveæ oval, shining, oblique and separated from each other by a carina; wings hyaline, with the subcostal and two transverse veins brownish red, the other veins nearly colorless, radial area present, areolet wanting; legs paler red than the thorax; abdomen black and polished, the sides of the first segment sparingly covered anteriorly with white hairs.

The galls vary in size from that of the flaxseed to 8 mm. in length, are shaped somewhat like the false chestnuts that are often seen in chestnut burrs, and rarely approach the shape of an acorn. From one to six of these galls have been found originating from between the acorn and the acorn cup of *Quercus ilicifolia.* The acorn is in most cases aborted through the presence of these galls, and the galls when mature fall to the ground. This is regarded as the agamous form of *A. operator.*

The type locality of this species is Waterbury.

***A. palustris** Osten Sacken. Succulent Oak Gall.

Female and male: length 2 to 2.5 mm.; mostly black; mouth brownish yellow, palpi brownish; antennæ filiform, 15-jointed, four to six basal joints yellow, the rest brown (in the male the basal joints also somewhat infuscated), third joint longer than the others, the fourth to eighth joints successively shorter than the joint next preceding (this difference in length not so marked in the male as in the female), the following joints equal in length; thorax smooth and shining, scutel deeply sculptured on its posterior aspect; legs yellow except the bases of coxæ which are brown, and the tips of the tarsi which are black; wings immaculate, with the thickened veins brown, those of the anterior portion of the wing especially dark, the basal vein sometimes obsoletely clouded, areolet distinct, cubitus distinct throughout its whole length and not quite reaching the margin; abdomen shining.

The galls of this species range from 9 to 10 mm. in diameter, are globular, hollow, green, succulent, contain a whitish free globular body about 2.5 mm. in diameter, and occur on the buds and young leaves of *Quercus palustris,* the pin oak.

The type locality of this species is Waterbury. New Haven, 5 June, 1906 (B. H. W.).

A. flocci Walsh.

Female: length 2-2.5 mm.; mostly black; vertex glabrous and a little polished, face brownish and apparently pubescent, palpi brown, antennæ apparently two-thirds as long as the body, 13-jointed, the basal half rufous, the terminal half dark brown; the apical joint more than half as long again as the penultimate; thorax glabrous, somewhat polished, with two longitudinal striæ converging toward the scutel and sometimes with a faint medial stria in addition, striæ obsolete anteriorly, pleuræ sometimes entirely opaque, subpubescent, sometimes with a moderately polished spot under the wings, scutel finely rugose, not polished, with basal shallow foveæ; legs uniformly honey-yellow, verging toward rufous, except the tarsal tips, which are obfuscated; wings hyaline, the principal veins and the cross veins brown, areolet distinct, radial area open and three to three and a half times as long as wide; abdomen polished, as seen from the side as wide as long, the second segment occupying about one-half its surface, the ovipositor more or less exserted.

This species is probably an inhabitant of *Quercus alba*, the white oak.

A. nigræ Osten Sacken.

Female: reddish brown on head and thorax, abdomen dark brown and shining; antennæ 14-jointed, with indication of an additional joint in certain lights, brownish yellow; anterior legs brownish yellow, intermediate or middle legs darker brownish on the femora and tibiæ, posterior legs still darker brown, all tarsi brownish yellow with infuscated tips; wings hyaline, subcostal and radial veins colorless or almost pellucid, areolet wanting, cubital veins very indistinct.

Of the two original galls from which this species was bred both were found along the midrib on the under side of a leaf of *Quercus nigra* or blackjack oak, one extending for about 25 mm. along the midrib, the other shorter, both greenish and about 5 or 7.5 mm. broad, and each containing several gall flies, which emerged between the 20th and 22d of June, the larger gall thereafter appearing to have been pierced nine times.

A. frondosus Bassett.

Only the gall of this species is known. This is a cone-like body, developed from the axillary leaf buds, and covered, when immature and often when dry, with a dense rose-like cluster of imperfectly developed leaves. The cell containing the larva is smooth, shining, oval, about one-eighth of an inch long, half immersed in the apex of the cone, and occurring on *Quercus chinquapin*. These galls are developed after the summer growth of the tree is complete and the axillary buds are formed. The rudimentary leaves are green, ligulate, and the more perfectly developed galls resemble the flowers of the common garden *Artemisia*. The clump of oak bushes from which the original specimens were gathered was covered with them.

A. topiarius Ashmead. Leafy Bower Gall.

Female: length a little more than 2 mm.; uniformly red brown, punctate; eyes dark brown, antennæ 13-jointed, slightly longer than the thorax and very slightly thickened towards the tip; thorax with the usual grooves so characteristic of this genus, only not so distinctly apparent as usual, the median longitudinal line being faintly traceable, as well as the two short lines on the shoulders, scutel rugoso-punctate, cushion-shaped, with two small oblique foveæ at base; abdomen polished, second segment occupying more than one-half the length of the abdomen, third, fourth and fifth segments subequal; wings hyaline, veins hyaline, so clear as to be traced with difficulty, the radial area open, areolet so pale as to be invisible, except when held up to the light, when it is seen to be distinct, cubitus obsolete.

The galls of this species in general appearance are exactly similar to those of *A. frondosus,* but not so large, comprising a cluster of small, deformed, lanceolate leaflets, with from three to five small, smooth, oval cells in its matrix; these cells are deciduous, measure from 1.5 mm. to a little more than 0.5 mm. in diameter, and like other leafy galls of this kind fall to the ground on reaching maturity. This species is infested by the following parasites: *Eurytoma studiosa* Say, and a species of each of the following genera: *Torymus, Synergus, Ceroptres* and *Platygaster.*

A. seminosus Bassett.

Female: length 2.5 mm.; head black, antennæ dark honey-yellow, 14-jointed, the first and third equal in length, the fourth to thirteenth thicker than long, the fourteenth longer and conical; mesonotum black, finely punctate, not hairy, the parapsidal and interparapsidal parallel lines hardly discernible, the dorsal or median lines indistinct, but extending more than half-way to the pronotum, a deep impression over the base of each wing, scutel shining but irregularly and coarsely wrinkled, its shining foveæ very deep and separated by a ridge; legs dark reddish brown, claws simple; wings with veins faint and the areolet subobsolete; abdomen black and shining, except the posterior margins of the terminal segments, which are yellowish brown.

The galls are hard woody knots, sometimes terminating the shoots in a clump of oak sprouts, but oftener an enlargement of the base of the small lateral branches. In some specimens the terminal galls are 25 mm. in diameter and shaped like a strawberry, others are about half as large and of the same shape; all are more or less uneven on the surface. In old galls the outer bark when fallen off reveals a surface which is dotted as thickly as possible with very small, open, larval cells to the number of several hundreds; the cells are distinct from the woody fibre in which they are imbedded but cannot be separated from it. These galls are easily taken for those of *A. scitulus*.

*A. piger Bassett. Oak Midrib Gall.

Female: length nearly 3 mm.; mostly deep black, ocelli inconspicuous in the rather coarsely rugose vertex, antennæ 14-jointed, the first joint club-shaped, second ovate, third not quite as long as the first and second combined, fourth, fifth and sixth subequal, the remaining joints scarcely shorter than the sixth and subequal, base clear yellowish brown, changing gradually to a light dusky brown toward the apex; thorax finely and evenly punctate, in a favorable light seeming to have two extremely faint parallel lines which extend half-way from the pronotum to the scutel, a smooth groove beginning at the scutel on the middle of the mesonotum, and ending suddenly as a groove but continuing as a faint depression half-way to the pronotum, the parapsidal grooves fine and narrow but distinct, a smooth polished line over the base of the wings, the scutel round and rugose, the foveæ large and deep; the legs rather a dark reddish brown; the wings hyaline, with sharply defined veins, a small areolet and open radial area and a colorless cubitus; abdomen polished and shining, first segment more than equal in length to the remaining ones combined, sheath of the ovipositor dark yellowish brown at the tip.

The galls of this species are large, irregular swellings on the midrib of the leaves of *Quercus tinctoria,* always on the under side and usually on the lower half of the leaf; sometimes two distinct galls are found on the same leaf, their presence being indicated on the upper surface by a widening of the midrib and a slight depression of the leaf at that point. They are often 25 mm. in length, and in the middle half 25 mm. in diameter, tapering more or less towards the ends. They are of a dense cellular tissue, with the woody fibre of the midrib along the axis. The cellular portion contains a large number of larval cells, which are inseparable from the enveloping substance. The galls are found on young oaks early in June. They answer, it might be added, the description of *Quercus tumifica* given by Osten Sacken.

***A. pattoni** Bassett.

Female: length 2 mm.; head reddish brown; antennæ 14-jointed, dusky brown, the last two joints indistinctly separated by a closely connected suture, entire head and face covered with short white hairs, tips of the mandibles black; thorax a very dark shining brown, appearing black in certain lights, its surface finely and evenly reticulate, the parapsidal grooves closely convergent at the scutel, the short line usually present over the base of each wing wanting in this species, a few scattered hairs on the borders of the mesothorax, most abundant at the base of the wings, scutel rugose and hairy, its foveæ large and shallow; legs of uniform reddish brown, except the darker tips of the tarsi; wings hyaline, veins dark brown, areolet present, cubitus very pale and sometimes quite disappearing before reaching the first transverse vein, radial area open, abruptly terminated by the short curve of the radial vein; abdomen shining blackish brown, lighter beneath, the ventral valve projecting a little above the dorsal.

The galls are clusters of larval cells along the midvein of the leaves of *Quercus obtusiloba,* on the under side and standing perpendicular to its surface. The cells are completely hidden in a short, dense, brownish wool. The largest clusters often extend along the midvein more than half the length. They are found on young trees, and usually on the leaves near the top of the stronger growing shoots. This species lives over the winter in the galls. The galls in their woolly covering resemble those of *A. flocci* of Walsh, but in the latter the woolly hairs are longer and that species is found only on *Quercus alba.*

Type locality: West Rock, New Haven, 1876 (W. H. Patton).

***A. utriculus** Bassett.

Female: length 2.5 mm.; head black, very finely rugose, face sparsely covered with short stiff hairs, antennæ 13-jointed, first joint short, club-shaped, second globular, third long and straight, fourth three-fourths as long as the third, fifth and succeeding ones, except the terminal one, one-half as long as the third, thirteenth with an indistinct suture in the middle, antennæ clear yellowish brown at the base, gradually changing to a dull deep brown at the tip; thorax black, mesothorax finely rugose, parapsidal grooves distinct and a broad deep median line from the pronotum to the scutel, line over the base of each wing present but indistinct, scutel coarsely wrinkled, sparsely hairy, foveæ connate, deep, smooth and shiny at the bottom; legs with anterior and middle pairs yellowish brown except the trochanter which is nearly black, posterior pairs darker brown; areolet very small and in some cases wanting, radial area open, surface of the wing more hairy than is usual among the Cynipidæ. Male: length 2 mm.; black, except the legs and antennæ, which are a little darker than in the female. Antennæ much longer than in the female, 15-jointed, third joint not incised; abdomen small, slender, shiny, the first segment equal in length to all the others.

The gall of this species is described as being globular, monothalamous, on the petioles and leaves of *Quercus alba;* it is thin-walled, 4 mm. in diameter, green or purplish, and pubescent, sometimes entirely preventing the development of the leaf and appearing on the end of the short petiole. It is sometimes found on the end of a vein of a partially developed leaf, and more rarely surrounded by the lamina of the leaf. In the last case it appears on both sides of the leaf, but is most prominent above. It contains no larval cell. In size and in structure it resembles *A. vesicula,* found on the same oak, but several weeks later. This species is said to be often quite abundant in a limited space, as in the locality where the author found it.

A. reticulatus Bassett.

Female: length 2.5 mm.; head and thorax very dark brownish red, approaching black; antennæ 13-jointed, the third joint hardly longer than the two preceding combined, fourth not quite as long as the third, fifth to twelfth subequal, thirteenth one-fourth longer and showing in a favorable light a dark ring near the tip, hardly distinct enough to be called a suture; mesothorax with an exceedingly fine reticulation and a few short scattered hairs, parallel lines reaching half-way from the pronotum to the scutel, these and the parapsidal grooves and the short lines over the base of the wings present; scutel pointed, finely rugose, its foveæ large, shallow and smooth; legs light yellowish brown, except the posterior pair which are much darker, claws simple; wings hyaline, veins slender and mostly colorless, areolet present, but indistinct, radial area open; abdomen shining yellowish brown, lightest anteriorly, second segment so long and deep as to nearly conceal the remaining segments.

The galls of this species are polythalamous, and occur on the midvein of what is probably one of the dwarf varieties of *Quercus virens*. The galls are prominent on both surfaces, but more so on the under side, are almost round and (dried specimens) 6 mm. in diameter. The dry galls are exceedingly hard, and bear a very close resemblance to those of *A. cicatricula*, though the scar or indentation invariably found in that species is wanting. The larval cells are not separable from the solid woody fibre around them, and they all radiate from a common centre.

A. capsulus Bassett. Oak Capsule Gall.

Female: length 2.5 mm.; deep shining black, with the exception of the antennæ, legs, and sheath of the ovipositor; head and thorax microscopically punctate and sparsely dotted with extremely fine short hairs, parapsidal grooves converging as they approach the scutel, a slight groove over the base of the wings, the short parallel lines represented by a very slight depression on each side of the rather prominent dorsal ridge, but these last so obscure as to easily escape notice, the scutel wrinkled rather than punctate and without foveæ; antennæ 13-jointed, first and second joints rugose, thirteenth as long as the eleventh and twelfth together and with a connate suture, amber colored, inclining to brown; coxæ and trochanters black or blackish brown, femora and tibiæ clear shining dark brown, paler at the joints, tarsi pale cinnamon brown, claws black; wings hyaline, veins pale brown, fading in the smaller ones to hyaline, areolet indistinct, radial area open; abdomen with its first segment equal in length to all the others taken together, the sheath of the ovipositor dark translucent brown, and not turned up at its extremity. Male: smaller, darker, and with a laterally compressed abdomen.

The galls are monothalamous, on slender pedicels on the margins of the leaves of *Quercus bicolor*, rarely more than one on a leaf, the pedicels from 12.5 to 18 mm. long; the galls themselves are 9 mm. long and 3 mm. in diameter, oval, and resemble very closely the capsules of certain mosses; the surface is rough, and with the pedicel finely pilose or rather pubescent; the pedicel is usually but not invariably the extension of a lateral leaf vein; the whole is of the color of the under side of the leaves of this species of oak. Most of the leaves which bear the galls are fully developed, but some are more or less imperfect and occasionally a gall is found on what is but a mere rudiment of a leaf. The galls appear with the leaves and the insects come out early in June. This little gall is a true larval cell, and its thin walls offer slight obstacles to the attacks of parasites.

A. (Callirhytis) radicis Bassett.

Length 4 mm.; dark reddish brown; head opaque; face, cheeks and vertex with short, bristle-like hairs, antennæ 14-jointed, the first joint short and thick, the second globular, length of the third one-fourth less than that of the two preceding, the diameter of each from the eighth to the fourteenth inclusive equal to their length, the last forming a very blunt cone, color of the antennæ dark reddish brown, changing gradually to a dark dusky brown toward the apex; thorax black, the punctuation fine, regular and even, parapsidal grooves extending throughout, shining lines over the base of the wings, a narrow but distinct median line from the pronotum to the scutel, and two parallel lines one on each side of the median line and in close proximity thereto, reaching half-way from the pronotum to the scutel, which latter is irregularly wrinkled, its foveæ round and shiny; abdomen dark reddish brown with brown translucent edges; second segment very long and with a dense band of yellowish white hairs on the anterior margin, the third segment mostly, and the remaining ones quite concealed; legs with trochanters black, the remaining joints very dark cinnamon brown, claws black, simple; wings hyaline, principal veins pale brown, others colorless, radial area present, the angle of the first transverse vein projecting sharply into the basal portion, areolet and the lateral veins bounding it entirely colorless.

Said to be an agamous form of *A. futilis euroterus* Osten Sacken. The author of this species under his original description writes that those taken in the act of ovipositing were in all respects like these described, except that the color of the antennæ, legs, and wings was a trifle darker — owing, no doubt, to the fact that these were exposed to the sunlight while the others were not. The females reared from *futilis* galls one season were 2.5 mm. in length, with wings of the same length as the body, and 13-jointed antennæ, nearly 2 mm. in length with a partial suture on one side of the terminal joint, also with the median line on the thorax entirely wanting; the head less hairy but with a few scattered hairs on the thorax and on the side of the second abdominal segment.

The galls of this species are blister-like swellings in the smooth bark of the roots of young white oak trees (*Quercus alba*), completely covering the roots in some places for the distance of two feet or more from the tree.

A. (C.) pulcher Bassett.

Female: length 2 mm.; head and thorax black, and evenly punctate, except the scutellum, which is evenly rugose; antennæ 14-jointed, the second oval, third one-fourth longer than the two preceding taken together, remaining joints gradually shorter, all connate, but alike distinct, and with a yellowish, almost metallic hue, cheeks grooved; mesothorax rounded, median line a slight depression, but punctate like the rest of the surface, parallel lines rather broad, shallow and polished, parapsidal furrows very fine and extending throughout, lines over the base of the wings present but indistinct, scutel evenly rugose, foveæ near together and rather deep and ovally elongate; legs very dark brown, claws simple; wings hyaline, veins colorless, except the subcostal and transverse, which are dark but not black, areolet wanting, radial area open. Male; antennæ 15-jointed, the first joint black, the second ovate, the third longer than the first two and slightly curved and incised, all except the first with the yellowish metallic hue noticed in the female; legs lighter than those of the female, the posterior pair darkest; the antennæ somewhat longer and the abdomen, smaller as usual in this sex.

The galls of this species occur on the aments of *Quercus tinctoria,* also *Q. rubra* measuring when dry, shrunken and shriveled, from 2.5 to 4 mm. in diameter. They are polythalamous, each gall producing four or five insects. The interior of the gall is of a very loose spongy texture and the outside thin and papery and green like the leaves. When fresh they are round and of the size of a common red currant. They differ from the galls of *Dryophanta palustris* Osten Sacken, which are sometimes found on the aments of *Quercus ilicifolia,* in the thin and smooth shell, and in being polythalamous. Flies of both sexes appear in May.

*A. (C.) **similis** Bassett. Scrub Oak Club Gall.

Female: length 3 mm.; head and thorax bright brownish red; abdomen red except the dorsal portion of the middle segment which is nearly black; vertex finely sculptured, face pubescent, the hairs converging toward the mouth, antennæ 13-jointed, the apical joint nearly as long as the two next preceding, with occasionally an obscure suture making it appear as though the antennæ were 14-jointed; thorax coarsely punctate, pubescent and a shade darker than the head, dorsulum with three faint longitudinal lines extending from the pronotum to the scutel, and two additional lines, one on each side of the median line and extending from the pronotum half-way to the scutel, furthermore with an obscure line on the dorsulum close to the insertion of the wings, scutel sculptured, its base provided with pits which are smooth; pleuræ with the central portion longitudinally striate; the legs uniformly brownish red, except the tips of the tarsi, which are black; wings rather whitish, the subcostal, anal, first and second transverse veins very pale yellow, the other veins colorless, the posterior side of the radial area not bounded by a vein, cubitus and areolet obsolete; the terminal segments of the abdomen withdrawn into the others in museum specimens, the sheath of the ovipositor turned abruptly upward but not extending above the back of the abdomen. Male: length 2 mm.; head and thorax black, antennæ 15-jointed, first and second joints nearly black, the remaining ones red; legs with the middle pair dark reddish brown, the posterior pair nearly black though still dark brown, lighter at the articulations than elsewhere; abdomen black and shining.

The galls of this species occur on the ends of the small limbs of *Quercus ilicifolia*. They are club-shaped, woolly, with a blunt apex, generally turned to one side, covered in summer with a few leaves, and usually contain one larva, though occasionally two or three larvæ. This species is closely related, both in the gall and in the insect itself, to *A.* (*C.*) *tuber* Fitch. Another species of oak on which it is said to occur is *Q. tinctoria*.

The type locality is Waterbury.

*A. (C.) **scitulus** Bassett.

Female: length 2.2 mm.; mostly black; vertex subrugose, sides of the head and the face sometimes a very dark brown; thorax regularly punctate, parapsidal grooves present, two parallel lines in certain lights to be seen lying between the parapsidal grooves and the median line or longitudinal depression, a deep groove over the dorsulum near the insertion of the wings, scutel regularly sculptured, without basal tips; legs shining, yellowish brown, middle of the femur and tibia darker than the same joints at their articulations with each other, tips of tarsi black; wings hyaline, first transverse and radial veins dark brown, the other veins pale but distinct, areolet present at the base of the open radial area. Male: very like the female in color and markings, but the antennæ are mostly amber color, except the terminal joints, which are light brown. As a rule the antennæ are 16-jointed.

The galls of this species grow upon the green twigs of *Quercus tinctoria,* sometimes causing simply an enlargement of the part affected, again entirely checking the growth of the affected part and being covered with leaves. These galls are from 18 to 37 mm. long and rather more than 12 mm. in diameter at the base; they are woody, tuber-like, and taper to a point.

The type locality of this species is Waterbury.

A. (C.) operator Osten Sacken.

Female: head yellowish red, especially beneath, antennæ 12-jointed, the joints beyond the third subequal, the third joint the longest, except the apical joint, which is a little longer than the third and seemingly partially subdivided into three joints; thorax reddish, indistinctly sculptured, parapsidal grooves extending from the pronotum to the scutel, these grooves delicately impressed but still distinct, in addition on the dorsulum four grooves as follows: one on each side between the preceding and the bases of the wings, and indications of one on each side between the parapsidal grooves and running from the pronotum to the middle of the dorsulum; scutel roughened and provided with basal pits; legs pale reddish, except the claws, hind tibiæ, and the bases of the hind tarsi, all of which are brown; wings hyaline, quite transparent, areolet wanting, subcostal, first and second transverse veins distinct and pale yellowish, the terminal portion of the subcostal vein wanting, the radial vein and end of cubitus pale and indistinct, that portion of the cubitus which usually extends from the first to the second transverse vein entirely wanting in this species, anal vein nearly obsolete. Male: differing from the female as follows: antennæ 14-jointed, the third joint distinctly incised beneath, the fourth and following joints nearly equal to one another in length and only slightly shorter than the third, the remaining joints successively diminishing in length toward the tip of the antennæ.

The gall of this species occurs on the blackjack oak (*Quercus nigra*); it is a rounded mass that looks like a collection of wool with numerous seed-like bodies within, and may be found on the twigs.

A. (C.) tubicola Osten Sacken.

Female: length 3 mm.; chestnut brown, darker on the abdomen than elsewhere, in immature specimens the body may be entirely reddish brown; antennæ 13-jointed, the joints near the base brownish, the remaining joints black; thorax inconspicuously pubescent; wings hyaline, subcostal and radial veins dark brown, areolet present and triangular, second transverse vein angular, the portion of the cubital vein anterior to the areolet indistinct; legs mostly yellowish brown, tips of the tarsi black.

The gall of this species is a perpendicular tube about 1 mm. in length, slightly contracted at the attached end and open at the opposite end, yellowish, covered on its exterior with numerous red spines. It occurs in clusters on *Quercus obtusiloba*.

A. (C.) seminator Harris. Oak Seed Gall.

Length 2.5 mm.; almost black, highly polished, especially on the abdomen and at the mouth; antennæ and legs reddish or ferruginous.

The gall of this species occurs in ring-like clusters around the smaller twigs of the white oak (*Quercus alba*). The galls are rough, reddish, sometimes as large as a walnut, when fully developed somewhat like a dried sponge in texture, with many egg-shaped, yellowish white, thin, tough cells within that are nearly 3 mm. long.

New Haven, 5 June, 1906 (A. F. Hawes); Wallingford, 9 June, 1908 (B. H. W.).

***A. (C.) tuberosus** Bassett.

Female: length nearly 2 mm.; antennæ 13-jointed, pale brown except toward the apex where they become rather dusky, first and second joints globular; legs pale brown and more uniformly colored than in the male; wings somewhat shorter than in the male; abdomen petiolate. Male: length 1.5 mm.; black; antennæ 15-jointed, first and second joints ovate, the former dark brown at base, paler beyond, second and six or seven following joints yellowish brown, remaining joints dusky, third joint curved but not excised; head punctate; thorax obscurely wrinkled, pleuræ striate, parapsidal grooves distinct though delicate, scutel finely rugose and provided with foveæ; legs brownish yellow; wings hyaline, veins pale, areolet distinct, cubitus extending to the first transverse vein, radial area open; abdomen petiolate.

In this species the galls reach maturity in June, and occur on the young shoots of *Quercus ilicifolia,* which are checked in their terminal growth; they are woody, polythalamous, and at most grow to be 15 mm. long and 6 mm. in diameter.

The type locality of this species is Waterbury.

*A. (C.) **punctatus** Bassett. Oak Knot Gall.

Female: length nearly 4 mm.; head and thorax black; face pubescent, palpi light brown, tips darker, antennæ reddish at the base, becoming dull dark brown beyond, 14-jointed; thorax punctate, parapsidal grooves converging toward the scutel, in addition to these a median longitudinal line on the dorsulum, and on each side of this latter a line extending from the pronotum to the scutel, finally two depressions or grooves, one over the base of the wings, scutel with coarse, irregular punctures; legs reddish brown, except the coxæ and tips of the tarsi, which are dark brown or black; wings hyaline, their veins brown, areolet present, radial area open; abdomen black above, reddish brown beneath, and with the exception of the first segment minutely punctate, second segment with a few hairs on the lower half.

The gall of this species is a rather smooth, club-shaped, woody knot, 100 mm. long, 37 mm. in diameter at the upper and largest end, and completely encircling branches as much as 12.5 mm. in diameter. It occurs on red, black, scarlet and scrub oaks.

The type locality is Waterbury. Orange, 9 January, 1914 (B. H. W.); Bloomfield, January, Lyme, March, Stonington, June, 1914 (I. W. Davis); New Haven, 19 March, 1915 (W. E. B.).

*A. (C.) **singularis** Bassett. Small Oak Apple.

Female: length nearly 4 mm.; head black and rugose, mouth parts dark brown, antennæ 13-jointed with, in some specimens, a rather distinct indication of an additional joint, antennæ slightly dusky yellow; thorax black, sparsely pubescent, coarsely punctate or pitted, with three distinct longitudinal grooves above; wings dusky throughout but not clouded and with dark reddish brown veins that disappear before reaching the margin, areolet equiangular; legs with the anterior pair as well as the middle pair dusky yellow, the posterior pair dusky brown; abdomen red, of a dull brick red color, after having been in alcohol, its second segment with a few scattered hairs beneath the wings, and a little less than half the length of the whole abdomen, the remaining segments microscopically punctate. Male: somewhat smaller than the female, otherwise differing as follows: antennæ approximately 3 mm. long or equal to the length of the body, and darker than in the female, composed of 16 more or less distinct joints; legs dark brown, posterior pair nearly black, all shining; abdomen black and shining, reddish beneath, second segment partially covering the succeeding one.

There is some question as to whether the above described male belongs to this species or not; both sexes, however, were bred at the same time from similar galls on the leaves of *Qurcus rubra,* the red oak.

The type locality of this species is Waterbury, 10 July.

***A. (C.) saccularis** Bassett.

Length 2.5 mm.; head black, vertex rugose, face with white hairs; antennæ 15-jointed, reddish brown at the base, dusky brown at the tip, first joint cup-shaped, second globular, third twice as long as the first and second combined, fourth and remaining joints each half as long as the third; thorax black, mesothorax coarsely wrinkled, dorsulum with entire parapsidal grooves that are rather indistinct anteriorly, two parallel lines extending half-way to the scutel, and a line over the base of the wings, these latter nearly uniting with the parapsidal grooves anteriorly, scutel wrinkled, with foveæ; posterior legs dark reddish brown, lighter at the joints than elsewhere, anterior legs lighter, claws simple; wings with slightly fuscous membrane and uniformly dark smoky brown veins, areolet present, cubitus reaching to the first transverse vein, radial area open; abdomen shining black.

Gall hemispherical, pouch-like, the largest not more than 4.5 mm. in diameter, attached by its base to the under side of the leaves of *Quercus coccinea.*

*A. (C.) **pustulatoides** Bassett.

Female: length 2.5 mm.; head and thorax dark brownish red, almost black; antennæ 13-jointed, third joint hardly longer than the first and second combined, fourth not quite as long as the third, fifth to twelfth subequal, thirteenth one-fourth longer than the preceding and with a suggestion of a suture near the tip; mesothorax reticulated and with some scattered hairs, parapsidal grooves present, in addition on the dorsulum parallel lines extending half-way from the pronotum to the scutel and lines over the base of the wings, scutel pointed, finely roughened and with smooth shallow foveæ; anterior and middle legs light yellowish brown, posterior pair much darker, claws simple; wings hyaline, veins mostly colorless, areolet present but indistinct, radial area open; abdomen shining yellowish brown, lightest anteriorly, the second segment nearly concealing the remaining ones.

This species gives rise to blister-like galls on the points of the acute lobes of the leaves of *Quercus coccinea.* Each gall is ovate-acuminate, 8.5 mm. in diameter, sometimes slightly depressed above, with thin walls enclosing a free, oblong-oval, thin-walled, larval cell, the length of which is at least twice its diameter, of the same color as the leaf and tipped with a long hair-like point.

The type locality is Waterbury.

*A. (C.) **futilis** Osten Sacken. *A. papillatus* Osten Sacken. Oak Wart Gall.

Length 1.5 mm.; mostly black; mouth slightly reddish, palpi, antennæ and legs mostly yellow, coxæ blackish at base, posterior femora slightly infuscated above; thorax smooth, indistinctly aciculated, scutel somewhat punctate; wings clear, veins brownish yellow, areolet present, cubitus mostly distinct, obsolescent only at its base; antennæ 15-jointed, third joint a little longer than the following joints, all of which are nearly equal to one another in length; abdomen shining, the second segment longest and covering nearly all of the succeeding segments.

This is said to be one of the most common gall insects in Connecticut. Its galls are rounded and project from both sides of the leaves of the white oak (*Quercus alba*). The specimens described as *A. papillatus* were reared from galls on the leaves of the chestnut oak (*Quercus prinus*).

The type locality is Waterbury.

***A. (C.) ceropteroides** Bassett.

Female: length 2 mm.; head shining blackish brown, with minute hairs, vertex finely wrinkled; antennæ 13-jointed, first and second joints nearly equal in size, the third one-fourth shorter than the first and second combined, the fourth nearly as long as the third, the following nearly equal to one another in length, all dull brownish red, darkest toward the apex; thorax black, shining, evenly transversely wrinkled, pleuræ and pronotum punctate, parapsidal grooves converging from the pronotum to the scutel, between the parapsidal grooves two parallel lines extending half-way between the pronotum and the scutel, in addition on the dorsulum a line over the base of each wing, these lines all rather indistinct, scutel smoother than the mesonotum, foveæ present; legs dark brown; wings hyaline, veins seemingly wanting; abdomen brown, smooth and shining.

The galls of this species appear at the base of the annual growths of the shoots of *Quercus tinctoria*.

The type locality for this gall-fly is Crescent Beach, Branford.

A. (C.) clavula Osten Sacken. White Oak Club Gall.

According to Bassett this species produces the gall described by Fitch as *Cynips quercus-arbos* (see *Ceroptres tuber*).

The galls of this species occur on white oak (*Quercus alba*).

Solenozopheria Ashmead.

S. vaccinii Ashmead. Huckleberry Gall.

Female: length 2 mm.; pale yellowish brown; minutely wrinkled but shining; antennæ 12-jointed, gradually and slightly thickened toward tips, the terminal two-thirds infuscated; dorsulum with parapsidal grooves that are more distinct posteriorly than anteriorly, scutel convex, with a curved depression at base, finely rugoso-punctate; tibiæ and posterior femora infuscated with a darker shade of brown on their upper edges; wings hyaline, radial area open, cubitus obsolete, veins pale brown, the first transverse vein margined with a faint yellowish stain, a slight yellowish stain in the break in the second longitudinal vein, and the areolet and base of the radial cells all inclosed in this yellowish stain or cloud; abdomen with the terminal segments brown.

The galls of this species are irregular, kidney-shaped, pithy, occur on the stems of huckleberry (*Vaccinum*), and range in diameter from 12 mm. to less and in length from 12 to 25 mm. or more.

Stonington, March, 1906 (W. E. B.).

Diastrophus Hartig.

D. cuscutæformis Osten Sacken. Blackberry Seed Gall. Pl. vi, Fig. 1.

Body mostly dark brown or black; antennæ reddish, 14-jointed in the female and seemingly 15-jointed in the male; legs reddish; areolet wanting; wings mostly hyaline, with a brown cloud near the anterior margin on the angle formed by the second transverse vein and the tip of the subcostal vein.

The individual galls of this species are round, spherical, hollow bodies about the size of small peas, and bristling with spines. They are very characteristically massed together, the masses completely encircling the stem or branch of the blackberry on which they occur.

Has been found in Hartford, April, 1901 (L. F. Colton), Stonington, 1907 (B. H. W.), and Mystic, 12, 14 March, 1915 (I. W. Davis); and no doubt occurs all over the state on blackberry, especially *Rubus villosus*. *Torymus, Ormyrus, Tetrastichus* and *Eurytoma diastrophi* have all been bred from galls of this species.

D. nebulosus Osten Sacken. Blackberry Knot Gall. Pl. vi, Fig. 2.

Female 2.5 mm. long; male 2 mm. long; pitch-black, smooth and polished above, antennæ reddish, 13-jointed in the female and 14-jointed in the male; legs reddish; wings hyaline, areolet distinct, second transverse vein and tip of subcostal vein slightly clouded.

The galls of this species are rather cylindrical swellings with an uneven surface, occurring on blackberry stems. The cells contained within the gall are surrounded by a homogeneous structure that becomes very hard when dry. These swellings, which encircle the twigs or stems on which they occur, are from 25 to 75 mm. in length or even longer.

This species no doubt occurs throughout the state especially on *Rubus villosus*. Woodbridge, 13 May, 1907 (W. E. B.), Mystic, 3 March, 1915 (I. W. Davis).

***D. potentillæ** Bassett. Cinquefoil Axil Gall.

Female: length nearly 3 mm.; very like the male, differing essentially only as follows: antennæ 13-jointed, ocelli arranged as though along a straight line; legs somewhat darker. Male: length approximately 2.7 mm.; head black, vertex nearly smooth, face finely scratched and with a carina extending from the vertex to the mouth, mouth parts faintly tinged with reddish brown, antennæ 14-jointed, the first, second and third joints black, the following joints dark cinnamon, the third joint not deeply incised; thorax black, pronotum hairy, mesothorax shining, parapsidal grooves originating at the pronotum and converging toward the scutel, the space between these two parapsidal grooves nearly smooth and hairless and with faint longitudinal grooves, scutel sculptured and with basal pits, when viewed laterally appearing as a cone the axis of which is at an angle of 45° to the axis of the body; legs very dark brown or black, coxæ black, femora and tibiæ yellowish brown above, tips of tarsi black or nearly black; pleuræ very finely scratched; wings pale dusky, veins distinct but not extending to the margin of the wings, the vein forming the base of the radial area with a heavy brown blotch, first transverse vein reddish brown, areolet present, radial area open, cubitus disappearing before attaining the first transverse vein; abdomen petiolate, perfectly smooth and shining black, the second and third segments connate.

The galls of this species occur on *Potentilla canadensis* and have the following characteristics: about 7.5 to 15 mm. in diameter, rather longer than thick, growing in the axilis of the leaves, of a soft spongy consistency when dry, and with a single cell inside that is not free from the surrounding substance.

Type locality: Waterbury.

***D. similis** Bassett.

Female: length 3 mm.; head black, vertex finely roughened, ocelli nearly arranged as though along a straight line, face roughened and carinate, mandibles black; antennæ 13-jointed, second joint half as long as the first, third to twelfth joints inclusive equal to one another in length, the terminal joint one-third longer than the preceding and with a faint trace of a suture encircling the same, the head posteriorly hairy; thorax black and shining, finely sculptured, parapsidal grooves smooth and strongly convergent at the scutel, which latter is unevenly rugose and provided with foveæ separated by a smooth ridge; legs uniformly reddish brown except the claws which are black, the middle of the posterior side of the hindmost legs with a dense tuft of hair much longer than in the other legs; wings hyaline, veins pale yellowish brown, areolet as well as the dark spot that usually represents the same wanting, cubitus reaching only half-way to the first transverse vein, radial area open; abdomen black and shining, first, second and third segments above subequal, the first segment with a round dense tuft of hair on the side, sheath of the ovipositor not exserted.

The galls of this species occur on *Nepeta glechoma,* and are either simple or compound, appearing on the leaves, petioles or stems; the simple ones are round, vary in size from 3 to 18 mm. in diameter, and contain from 1 to 6 or more larval cells; the compound galls are irregular in size and form and have two or more distinct clusters of cells within them.

The specimens from which this species was first described were cut from the galls 23 October, 1879, presumably from galls taken in the vicinity of Waterbury. The insects thus found were living, which seems to indicate that this species passes the winter in the galls.

The type locality of this species is probably Waterbury.

***D. radicum** Bassett. Raspberry Root Gall.

Female: length nearly 3 mm.; head black and smooth, face with hairs that converge toward the mouth; antennæ 13-jointed, the joints distinct, hairy and nearly equal to one another in length, brownish yellow and not shining; mesonotum shining black and smooth, with parapsidal grooves, two median lines, and a short line on each side over the base of each anterior wing, scutel black, rather regularly grooved and ridged, foveate, the foveæ finely rugose; wings somewhat dusky, veins dark red, areolet distinct, radial area open, the second transverse vein extending along the margin of the wing one-third the length of the area, radial vein thickened at the margin of the wing and usually with a branch springing therefrom along the margin of the radial area, showing a tendency toward a closing at the radial area; legs clear and dark amber color, base of trochanters and middle of femora and tibiæ shining brown; abdomen mostly black, smooth, and with the ventral sheath clear shining brown. Male: smaller than the female and essentially different otherwise as follows: antennæ 14-jointed, third joint deeply incised, the antennæ and the legs slightly darker than in the female, length 2.2 mm.

The galls of this species are to be found on the roots of *Rubus villosus* and have the following characteristics: shape irregular, size ranging from that of the pea to 50 mm. or more in length and nearly 25 mm. in diameter, few or many larvæ within according to size. Sometimes the galls are present on the portion of the stalk which is below the ground.

The type locality for this species is Connecticut.

***D. minimus** Bassett.

Female: length 1.5 mm.; mostly black; antennæ 13-jointed, first and second ovate, the third straight, the following joints uniform in length; thorax smooth and shining, parapsidal grooves closely converging toward the scutel, which latter has a finely and regularly rugose surface and a shining fovea; wings faintly dusky, veins very dark and distinct, areolet subobsolete, cubitus reaching the first transverse vein, radial area open, second transverse vein especially dark and distinct; legs pale reddish brown; abdomen smooth and shining. Male: length 1.2 mm.; antennæ 14-jointed; legs rather lighter yellowish brown than in the female, in nearly all other particulars like the female.

The galls of this species occur as globular or oval blisters arising abruptly between the nodes of the stems of *Potentilla*, are often more than 1.5 mm. in diameter, are dark, smooth, and contain one or two larval cells.

Connecticut is probably the type locality of this insect.

D. bassetti Beutenmüller.

Male: length 4 mm.; body jet-black, shining; head with a number of shallow punctures from each of which grows a yellowish hair, mouth-parts pitchy brown, antennæ testaceous, 13-jointed the first joint much thicker at the apex than at the base, second joint almost globular and nearly half as long as the first, which latter is shorter than the third, which in turn becomes slightly thicker toward its apex, fourth to sixth joints about the same in size and shorter than the third, the remaining joints somewhat smaller but uniform in size, apical joint rosebud-shaped, antennæ sparingly covered with yellowish hair; thorax smooth and shining, parapsidal grooves present, scutel less shining than the rest of the thorax and deeply corrugated in much the same manner as the sides and extreme anterior portion of the thorax; legs testaceous.

The galls of this species occur on the stems of wild dewberry, *Rubus villosus* (*canadensis*). New Haven, 9 May, 1907 (B. H. W.).

D. **niger** Bassett.

Female: length 2 mm.; entirely black and shining; head finely punctate, antennæ 13-jointed, first and second joints reddish brown, all except the second of equal length; thorax smooth and shining, dorsulum with only the parapsidal grooves present and bounded behind by a sharp transverse ridge, scutel rugose, hardly bifoveate though there is a scarcely discernible line dividing the large shining basal pit; legs brown; wings hyaline, veins dark, first and second transverse veins distinct, radial area open and with a dark cloud at its base, areolet wanting, cubitus distinct and thickest where it joins the first transverse vein; abdomen shining black, the sheath of the ovipositor translucent brown.

The galls occur on *Potentilla canadensis,* differ greatly in form and size, the smallest being round or oval and not larger than the smallest pepper seed, and containing not more than one or two larval cells, the largest being 25 mm. long and 6 mm. in diameter, involving the whole stem, and containing a dozen or more larval cells. When the large galls include a joint of the plant the former is enlarged with the rest of the plant but the axillary buds are not affected.

D. **turgidus** Bassett.

Female: length 3 mm.; head black and shining, antennæ reddish brown, 13-jointed, the joints nearly equal in length, the upper portion of the face roughened, the lower portion with fine grooves converging toward the mouth; mesothorax smooth and shining black, parapsidal grooves present, the lines between the latter to be seen only in a favorable light, faint linear depressions, one on each side, over the bases of the anterior wings, scutel finely wrinkled and with deep smooth foveæ, pleuræ finely striate; wings dusky, veins distinct, areolet sometimes obsolete, radial area open, radial vein reaching to the first transverse vein, second transverse vein spreading out at the base of the radial area into a dark reddish brown cloud; legs dark amber color, except the trochanters and the middle of the femora and tibiæ, all of which are clear dark brown; abdomen black and smooth, but with the ventral sheath reddish brown. What is believed to be the male of this species has the legs darker, the antennæ 14-jointed and the third joint deeply incised.

The gall is 25 mm. long, 18 mm. thick, and occurs as an abrupt swelling involving the whole circumference of the stalk of *Rubus strigosus*. The gall is pecked by birds and the legitimate inmates of the gall are attacked by many parasites.

Rhodites Hartig.

R. bicolor Harris. Spiny Rose Gall.

Thorax opaque, furrows between the parapsidal grooves appearing as distinct ridges when viewed obliquely, scutel deeply rugose, pleura with hardly any representation of a glossy spot but almost uniformly sculptured throughout; second transverse vein with a light projection at about its middle in the radial area, the veins forming the anterior angle of the areolet and the part of the cubital vein before the areolet often subobsolete, close by the posterior angle of the areolet a pale brown line like a stump of a vein. Female: length nearly or exactly 4 mm.; with a brownish cloud on the radial area of the wings; legs, except at bases of coxæ reddish; abdomen reddish. Male: almost exactly as long as the female, mostly black; legs reddish, except coxæ, which are black; wings rather clouded along the distinct veins and with two conspicuous clouds in the apical area.

The galls of this species occur singly or in clusters of three or four, the galls themselves are 9 to 10 mm. in diameter and covered with spine-like processes nearly as long as the diameter of the gall itself. It is said to be the commonest rose gall. Stonington, 26 July, 1906 (J. A. Hyslop); New Haven, 24 January, 1911 (A. B. C., B. H. W.).

R. ignotus Osten Sacken. Mealy Rose Gall. Pl. vi, Fig. 3.

Female: length 3.5 mm.; legs, including coxæ and abdomen, reddish. Male: length 3 to 3.2 mm.; mostly black, coxæ and base of femora black, rest of legs red.

New Haven, on *Rosa carolina;* Woodbridge, 12 May, 1907 (W. E. B.).

R. dichlocerus Harris. Long Rose Gall.

Female: length 3.5 mm.; mostly brownish red, antennæ black, except the first, second and third joints, which are entirely or mostly red. Male: length 2.5 mm.; mostly black, base of abdomen red.

The galls of this species are hard, woody, irregular swellings about 50 mm. long and about 12 mm. in diameter, occurring on the branches of *Rosa carolina.*

Mystic, 6 March, 1915 (I. W. Davis).

R. radicum Osten Sacken. Rose Root Gall.

Mostly black, abdomen sometimes brownish, first and second joints of the antennæ sometimes reddish brown, mandibles reddish. Female: length nearly 4 mm.; coxæ dark reddish, except at the base, where they are black. Male: length nearly 3.5 mm.; coxæ black.

The galls of this species are rounded, warty, smooth on the outside, contain numerous cells that are separated by pithy material, and occur on the roots of wild roses.

R. rosæ Linnæus. Mossy Rose Gall. Pl. vi, Fig. 5.

Female: length 3-4 mm.; mostly black, mandibles reddish; legs reddish, except coxæ and tips of tarsi, which are black; wings pale brownish, with a brown cloud on the radial area and its vicinity; pleuræ with two oblong shining areas; abdomen reddish, except the four last segments, which are black. Male: mostly black.

The galls of this species are moss-like masses consisting of hard cells covered with long and dense greenish filaments, the cells arranged around a branch of rose or blackberry.

Westville, 1904 (W. E. B.); Mystic, 3 March, 1915 (I. W. Davis).

°**R. vernus** Osten Sacken. Knotty Rose Gall.

Mostly black. Female: length nearly 4 mm.; abdomen mostly red; legs reddish, except the bases of the coxæ, which are black; wings tinged with brown and with a more or less distinct cloud on the radial area and its surroundings. Male: length 2.5 to nearly 3 mm.; legs reddish, except the coxæ which are black, and the femora which are brownish; wings hyaline.

The gall of this species occurs on *Rosa lucida.*

R. lenticularis Bassett. Rose Lentil Gall.

Female: length 2 mm.; head black, first three joints of the antennæ dark reddish brown, the rest dull black, first and second joints globular, third half again as long as the fourth, the latter slightly longer than the succeeding one; thorax black, mesonotum not shining, parapsidal grooves distinct with only faint lines between, pleuræ shining in the middle, scutel finely wrinkled; legs dark reddish brown; wings subhyaline, with a faint reddish cloud on and around the radial area, veins distinct, areolet present. Male: with wings more nearly hyaline and without any trace of cloudiness; nearly as long as the female.

The galls of this species are lentil-shaped, occur in the parenchyma of the leaves of *Rosa lucida,* are apparent on both the upper and the under side of the leaf, and are from 2.5 to 4 mm. in diameter horizontally and 2 mm. in diameter vertically. Usually the galls are confluent, irregular in outline, sometimes single, in some cases covering the entire leaf, while in other instances only the right or left lobe is bedecked.

IBALIIDÆ.

Ibalia Latreille.

The characters for this genus are the same as those given for the family to which it belongs.

°**I. ensiger** Norton.

Female mostly black with reddish abdomen, ovipositor two-thirds the length of the abdomen and concolorous with the same; legs black and shining, except the apical joints of the tarsi, which are obscurely reddish; wings hyaline, apices translucent blackish.

I. maculipennis Haldeman.

Female: 14 mm. long; mostly yellow; mesothorax and metathorax black except two longitudinal bands above and a spot beneath the wings; scutel yellow; apices of antennæ, bases of coxæ, middle of anterior and middle femora and greater part of posterior femora, black, posterior tibiæ blackish toward apex; wings yellowish, with the apex and a central spot infuscated.

New Haven, 8 May, 1911 (A. B. C.), 24 September, 1913 (W. E. B.), 25 May, 8 June, 1915 (M. P. Zappe); Lyme, 4 July, 1911 (A. B. C.).

CHALCIDOIDEA.*

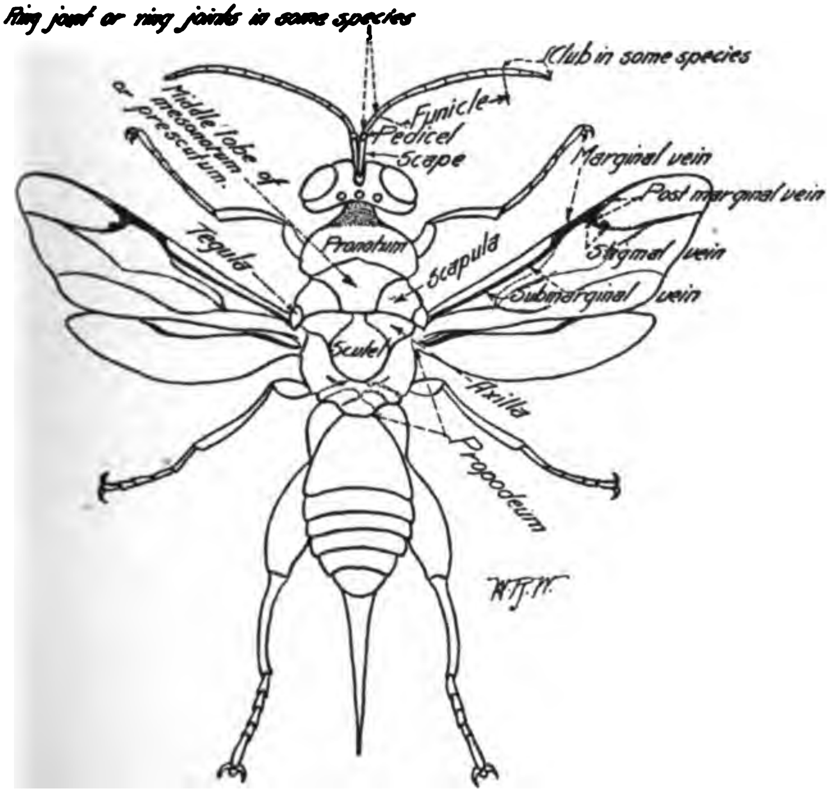

FIG. 11. *Phasgonophora sulcata.*

NOMENCLATURE OF WING PARTS IN THE DRAWING OF *PHASGONOPHORA SULCATA.*

OLD SYSTEM.	COMSTOCK-NEEDHAM SYSTEM.
Submarginal vein . . .	$Sc+R+M$
Marginal vein	Sc_2+R_1 (1st abscissa or part)
Postmarginal vein . . .	Sc_2+R_1 (2d abscissa or part)
Stigmal vein	r (radial cross vein)

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*In the compilation of this superfamily liberal quotations have been taken from the works of Doctors Wm. H. Ashmead and L. O. Howard. Mr. J. C. Crawford has looked over the copy and suggested important changes that have been adopted.

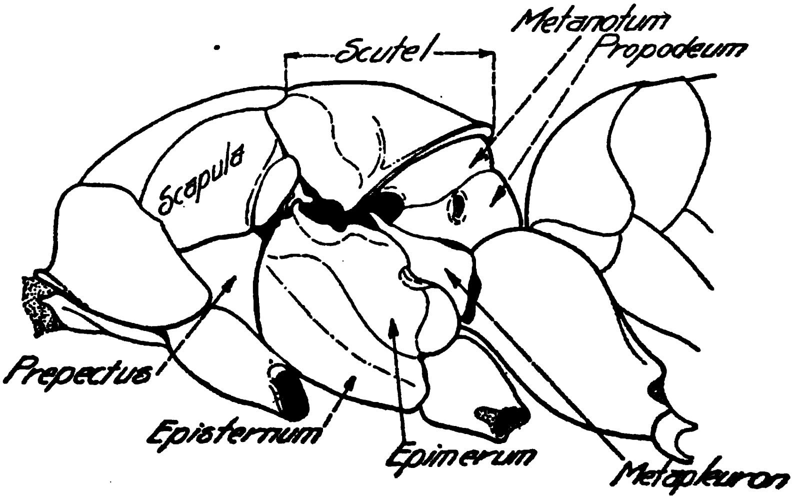

FIG. 12. *Thorax of Syntomaspis.*

Key to Families.

1. Hind wings not linear, not pedunculate at base; ovipositor issuing far in front of tip of abdomen; antennæ elbowed, and with one, two, or three ring-joints, very rarely without ring-joints 2
Hind wings linear, pedunculate at base; ovipositor usually issuing just in front of tip of abdomen; antennæ in female most frequently terminating in a distinct fusiform or egg-shaped, solid club, more rarely in a two-jointed club MYMARIDÆ p. 446
2. Tarsi 4- or 5-jointed, fore tibiæ armed with a large curved spur; antennæ usually many jointed 3
Tarsi usually 4-jointed, rarely 3-jointed; very rarely heteromerous; fore tibiæ with a delicate short straight spur; antennæ usually with few joints; antennæ at most 9-jointed 15
3. Hind femora much swollen 4
Hind femora not greatly enlarged 5
4. Fore wings, when at rest, folded longitudinally; ovipositor curved over dorsum of abdomen ......LEUCOSPIDÆ p. 528
Fore wings never folded; ovipositor not curved over dorsum of abdomen ....CHALCIDIDÆ p. 526
5. Thorax strongly developed, much arched and deeply punctate 6
Thorax not strongly developed 7
6. Stigmal vein not developed; second abdominal segment enclosing other segments ....EUCHARIDÆ p. 525
Stigmal vein developed; abdominal segments visible...... PERILAMPIDÆ p. 524

7. Pronotum large; antennæ many jointed; notauli complete.. 8

Pronotum small, frequently not visible in the middle; antennæ usually with few joints 9

8. Body not metallic; sides of scutel almost straight .... EURYTOMIDÆ p. 517

Body metallic; sides of scutel curved CALLIMOMIDÆ p. 512

9. Mesosternal pleuræ not visible; mid legs long, saltatorial, with a very long tibial spur 10

Mesosternal pleuræ distinct; mid legs not saltatorial, first tarsal joint not swollen 12

10. Antennæ more than 6-jointed 11

Antennæ 6-jointed; marginal vein about as long as subcostal vein ....SIGNIPHORIDÆ p. 506

11. Antennæ 13-jointed; occipital margin of vertex rounded...... EUPELMIDÆ p. 507

Antennæ 11-jointed; occipital margin of vertex usually acute; notauli obliterated ....ENCYRTIDÆ p. 491

12. Antennæ 12- or 13-jointed 13

Antennæ 8-jointed; notauli distinct; middle tibial spur moderately long ....APHELINIDÆ p. 487

13. Antennæ 12-jointed 14

Antennæ 13-jointed, with two ring-joints and three joints to the club; occipital line incomplete .... PTEROMALIDÆ p. 468

14. Abdomen distinctly petiolate; occipital line complete........ SPALANGIIDÆ p. 484

Abdomen almost sessile; pronotum scarcely visible in the middle, submarginal vein subangulate, stigmal club often large, notauli distinct; funicle of antennæ 5-jointed ...... TRIDYMIDÆ p. 486

15. Tarsi 4-jointed 16

Tarsi 3-jointed; pubescence of wings arranged linearly.... TRICHOGRAMMIDÆ p. 449

16. Submarginal vein entire, furnished with many bristles, postmarginal distinct; hind tibiæ sometimes with two spurs.... 17

Submarginal vein broken, postmarginal sometimes wanting; hind tibiæ with one spur; male antennæ simple 19

17. Abdomen sessile or with a distinct petiole that is transverse and smooth; notauli either absent or else represented only by very slight impressions 18

Abdomen usually with a distinct petiole; notauli very distinct; antennæ inserted below middle of face, simple in male ....ELACHERTIDÆ p. 464

18. Hind coxæ very large and strongly compressed; head semiglobose, front deeply, sparsely punctate; antennæ flabellate in male ....ELASMIDÆ p. 463

Hind coxæ normal; postmarginal and stigmal veins rather long; antennæ often flabellate in male..EULOPHIDÆ p. 460

19. Submarginal vein either ornate or provided with two bristles; metapleuræ very small; scutel with two bristles near the middle .... ENTEDONTIDÆ p. 455
Submarginal vein with from one to five bristles; metapleuræ triangular, not small; postmarginal vein usually absent; scutel with four bristles, all behind the middle, often with two longitudinally impressed lines; abdomen sessile TETRASTICHIDÆ p. 451

MYMARIDÆ.

To this family belong some of the smallest of insects. All of its species, so far as known, are parasites in the eggs of other insects.

Key to Genera.

1. Tarsi 4-jointed 2
Tarsi 5-jointed 3
2. Abdomen distinctly petiolate; female with its antennal club not jointed, but solid; marginal vein punctiform; antennæ 9-jointed; marginal vein in male as in female; antennæ in male 13-jointed .... **Polynema** p. 446
Abdomen sessile or subsessile; marginal vein lengthened; antennæ 9-jointed in female, 12-jointed in male.. **Anaphes** p. 447
3. Abdomen not petiolate 4
Abdomen petiolate; antennæ 9-jointed in female, 10-jointed in male .... **Camptotera** p. 448
4. Females 5
Males 8
5. Antennæ with more than eight joints 7
Antennæ 8-jointed 6
6. Marginal vein long .... **Leimacis** p. 448
Marginal vein short .... **Alaptus** p. 448
7. Antennæ 9-jointed; marginal vein long .... **Litus**
Antennæ 11-jointed; marginal vein short .... **Gonatocerus** p. 449
8. Marginal vein short 10
Marginal vein long 9
9. Antennæ 11-jointed .... **Leimacis** p. 448
Antennæ 13-jointed .... **Litus**
10. Antennæ 10-jointed .... **Alaptus** p. 448
Antennæ 13-jointed .... **Gonatocerus** p. 449

Polynema Haliday.

Cosmocoma Foerster.

°P. howardi Ashmead. *Cosmocoma elegans* Howard.

Male: length 0.9 mm.; antennæ distinctly longer than the body, pedicel bulbous, much broader than the succeeding joint;

body mostly shining black; scape and pedicel brown, rest of antennæ black; all tarsi entirely light honey-yellow, except the apical joint, which is blackish, as are the veins of the wings.

Parasitic on scale insects of the genus *Kermes*.

Anaphes Haliday.

A. (Anaphoidea) conotracheli Girault.

Female: average length 0.55 mm.; differing from the male chiefly as follows: first and second joints of antennæ pale yellow; abdomen longer, cylindric-oval, glabrous, black, its anal segment hairy; ovipositor slightly exserted; mouth area yellowish, the mandibles, however, brown; antennæ pubescent, not as long as the body, first joint curved and twice as long as the second, more slender than the corresponding joint in the male, second and third each globate, the latter abruptly smaller, fourth columnar, fifth to eighth cylindric-oval, subequal, apical joint much longer, larger, and ovate.

Male: average length 0.48 mm.; body black, shining; legs (except most of the middle of the femora, portions of the tibiæ, and tips of the tarsi, all of which are darker), apical two-thirds of scape, and venation pale yellowish or stramineous; antennæ and legs with whitish pubescence; head wider than the thorax and with sparse whitish hairs, minutely striate, ocelli inconspicuous, mandibles yellowish brown, falcate, bidentate at tips; thorax convex, longer than the head and abdomen combined, irregularly striate, dorsum of mesothorax with a deep round fovea on each side near the insertion of the wings; abdomen subglobate, its dorsum hispid; venation of wings pale, indistinct; antennæ longer than the body, funicle filiform, hirsute, first joint curved, convex, subreniform, second globate, third to twelfth cylindrical, subequal in length, becoming gradually longer toward the apex of the funicle, third and fourth joints thicker than the following.

Parasitic on the eggs of the plum curculio (*Conotrachelus nenuphar*).

Berlin (W. E. B.).

°**A. gracilis** Howard.

Female: length 0.7 mm.; antennæ as long as the head and thorax combined, fourth to eighth joints gradually increasing in length and thickness, apical joint or club as long as the eighth to eleventh joints combined, somewhat pointed at apex, mostly dark brown, nearly black; antennæ rather light brown, club darker; all legs dark brown, lighter at joints, tarsi lighter; base of abdomen yellowish; wing veins dusky.

This is listed as a parasite of the oyster-shell scale, *Lepidosaphes ulmi* (*Mytilaspis pomorum*).

Camptotera Foerster.

°**C. clavata** Provancher.

Female: length 2 mm.; mostly black, highly polished; antennæ and legs orange-yellow; antennæ inserted upon a frontal ledge.

Leimacis Foerster.

Limacis Dalla Torre.

°**L. aspidioticola** Ashmead.

Head and thorax light reddish; head nearly as wide as the thorax, apical joint of antennæ club-shaped; a dark spot on thorax at base of each wing; wings hyaline, both fore and hind wings ciliated from end of costal vein, no other visible veins, a small dark reddish spot on fore wings at tip of costal vein; end of abdomen darker brown than the thorax, two oblong brown spots on each side of the abdomen; legs rufo-stramineous; ovipositor scarcely exserted.

Parasitic upon Glover's scale, *Lepidosaphes* (*Mytilaspis*) *gloveri*. The larvæ upon hatching feed upon the eggs of the host.

Alaptus Haliday.

°**A. aleurodis** Forbes.

Female: length about 1 mm.; mostly black and shining; antennæ as long as the body, scape arcuate, reaching to the top of the head, and about as long as the three succeeding joints combined, nearly smooth, as is also the second joint, remaining joints densely hairy, club not jointed, as long as the three preceding joints combined, first joint obconic, second about the same length as the first but narrower; abdomen alutaceous; head and thorax punctate; antennæ yellow; legs mostly yellow, femora and tibiæ of the mid and hind legs black, their tarsi yellow.

Bred from *Aleurodes aceris*.

Gonatocerus Nees.

°**G. anthonomi** Girault.

Female: average length 0.85 mm.; head and thorax pitch-black; abdomen suffused with brown, piceous along the sides and toward apex, its basal segment lighter, front of head with a distinct inverted V-shaped pale mark, reaching from a point on the vertex to the lower inner margin of the eye; eye margins pale; thorax with an oblique longitudinal pale streak; legs honey-yellow, except the whole of the middle of the femora, the hind femora, coxæ, portions of the basal joint of the trochanters, and almost, if not quite, the whole of the middle and hind tibiæ, all of which exceptions are blackish, tips of tarsi darker; antennæ dull reddish brown, and with some black, except the scape and pedicel, which are yellowish, partly tinged with blackish; thorax impunctate, faintly shagreened, about as broad as the abdomen; the latter pointed, the first segment faintly striate and with a round fovea at base; wings with a purplish hue, venation dusky yellowish; scape as long as the following four joints combined; pedicel oval, much longer than the succeeding joint, third, fourth and fifth joints shortest, sub-equal, fifth slightly longer. Male: length 0.81 mm.; scape longer than the following joint; otherwise nearly as in the female.

Presumably bred from the eggs of *Anthonomus quadrigibbus* in the fruit of *Cratægus*.

TRICHOGRAMMIDÆ.

Anterior wings with regular rows of hairs; submarginal vein reaching the costa.

Parasitic in the eggs of the several orders of insects.

Key to Genera.

Antennæ 3-, 5-, or 8-jointed ....**Trichogramma** p. 449
Antennæ 7-jointed, with one ring-joint and a 4-jointed club **Lathromeris** p. 451

Trichogramma Westwood.

°**T. ceresarum** Ashmead.

Female: length nearly 1 mm.; mostly reddish yellow; abdomen and hind femora fuscous, fore and mid femora pale brown, tibiæ and tarsi pale, thorax triangular in front; abdomen wider but not longer than the thorax; wings hyaline, with very strong violet reflections.

Reared from the eggs of *Ceresa bubalus.*

°T. intermedium Howard.

Female: somewhat smaller and not quite so dark as the male; in life honey-yellow; abdomen in life pale, banded transversely with dusky; legs and antennæ in life greenish olive, apical two-fifths of tarsi fuscous. Male: length 0.55 mm.; mostly dirty yellow; face bright yellow, antennæ slightly dusky; mesonotum light yellowish gray, metanotum yellow; abdomen above slightly darker than mesonotum; all coxæ dusky, hind femora slightly dusky above, rest of legs dull yellowish; wings with a slight cloud below submarginal vein, the nearly straight line of hairs extending downward from tip of stigma consisting of five hairs, the first one sometimes included in the stigmal club, leaving only four in the row.

Reared from the eggs of *Aglais milberti* and (*Nisoniades*) *Thanaos lucilius.* Other hosts are: (*Danais*) *Anosia plexippus,* (*Grapta*) *Polygonia interrogationis,* and *Œneis macounii.*

°T. flavum Ashmead.

Female: length 1 mm.; head wider than thorax, brownish; antennæ 5-jointed, yellowish red, first joint longer than second and third combined, and narrower than second; third and fourth joints equal in length, narrower than second, apical joint as long as second, third and fourth combined and much wider, claviform; thorax and abdomen mostly bright yellow, thorax reddish where it joins the abdomen; first to fifth abdominal segments with some brownish color around the spiracles; wings hyaline; legs paler, but uniform in color, tarsi 5-jointed.

Listed as an American parasite of the cosmopolitan scale, *Lecanium hesperidum.*

T. (Pentarthron) minutum Riley. *T. minutissimum* Packard. *T. pretiosum* Riley. *T. odontotæ* Howard.

Length about 0.3 mm.; mostly yellow; head wider than thorax; antennæ 5-jointed, third and fourth joints in the female forming an ovate mass which is shorter than the second joint, fifth joint obliquely truncate, third, fourth and fifth joints in the male forming a more or less distinct club; hairs of the wings arranged in about fifteen lines; abdomen not as wide as the thorax, but as long as the head and thorax together; in the female the sides subparallel and the apical segment suddenly narrowed to a point.

Reared from eggs of *Aletia argillacea* and *Odontota suturalis.* Other hosts are: *Plusia brassicæ, Heliothis armigera, Papilio glaucus,* (*Pyrameis*) *Vanessa atalanta,* (*Limenitis*) *Basilarchia archippus,* and (*Pteronus*) *Pteronidea ribesi.*

Lathromeris Foerster.

°**L. cicadæ** Howard.

Female: length 0.74 mm.; antennæ clavate, pedicel stouter than the scape and about half as long as the latter, club stouter than the pedicel and as long as the scape, compact but rather plainly divided into four subequal joints, and fusiform in shape; stigmal vein extending into the wing at an angle of 45° from the costa and not curved; abdomen acuminate and longer than the head and thorax combined, mostly sordid yellowish in color; occiput black; pronotum dusky black laterally; abdomen dark at sides; antennæ slightly dusky. Male somewhat shorter than the female; abdomen with parallel sides and rounded at tip; antennæ with a dark blotch at base of club.

Reared from the eggs of the seventeen-year locust or periodical cicada. This parasite passes through from two to three generations in seven to eight weeks, the egg period of its host.

TETRASTICHIDÆ.

Key to Genera.

1. Genera differing from *Hyperteles* 2
Metanotum with a v-shaped median carina, more rarely with a straight median carina; mesonotum without a median grooved line; abdomen conically produced. Female: pronotum not conical; antennæ 10-jointed, with two ring-joints; abdomen two or more times longer than head and thorax combined. Male: metanotum not punctate; abdomen neither cylindrical nor sculptured, its segments not subequal, head and thorax smooth, not strongly sculptured or closely punctate; hind wings not acutely pointed at apex; antennæ 9-jointed, with one ring-joint; wings fully developed; abdomen much longer than the thorax..**Hyperteles**

2. Scutel with two or four furrows 3
Scutel without furrows; wings without a stigmal vein...... **Anozus** p. 452

3. Scutel with two furrows; scape not especially thickened; antennæ in male 9-jointed, without ring-joints, in female 10-jointed, with two ring-joints and a 3-jointed club...... **Tetrastichus** p. 453

Scutel with two or four furrows; antennæ 8- or 9-jointed, with one ring-joint; mesonotum without a median grooved line; abdomen rotund, shorter than thorax but wider. Female: pronotum not conical; head and thorax smooth or nearly so, at most only sparsely punctate; propodeum smooth, with a delicate median carina. Male: fully winged; black, or at least aeneous black......**Syntomosphyrum** p. 452

Anozus Foerster.

°**A. siphonophoræ** Ashmead.

Female: length 1 mm.; black, smooth, shining, impunctate; front deeply emarginate, antennæ black; mesothorax broader than long, parapsidal furrows deep, pleura blue-black; all coxæ black, trochanters, tips of femora and tibiæ, and all tarsi, yellowish; wings hyaline, veins pale brown, marginal vein about as long as the submarginal, postmarginal vein absent; abdomen sessile, ovate, yellowish at base.

Reared from plant lice of the genus *Nectarophora*.

Syntomosphyrum Foerster.

°**S. orgyiæ** Ashmead.

Female: length 0.9 mm.; mostly polished black; scape and legs brown; the knees and tips of tibiæ whitish, femora obfuscated in the middle; flagel brown, pubescent, the funicular joints scarcely longer than thick; wings hyaline, pubescent, veins light brown; abdomen orbicular, subsessile, much shorter but a little wider than the thorax, its segments nearly equal in length.

Reared from the white-marked tussock moth (*Hemerocampa leucostigma*).

S. esurus Riley. *Cirrospilus esurus* Riley.

Length 1.5 mm.; mostly dull black; joints of flagel in male subequal in length and beset with bristles, antennæ in female with the fourth and fifth joints shorter than the second and third, the last three joints forming a club; female antennæ 8-jointed; male antennæ 9-jointed; thorax above microscopically punctate, parapsidal grooves distinct and elevated; wings hyaline, pubescent; knees, tibiæ, and tarsi yellowish, the posterior tibiæ sometimes dusky; abdomen ovate, sessile.

Reared from pupæ of *Aletia argillacea*, the white-marked tussock moth (*Hemerocampa leucostigma*), fall web-worm *Hyphantria cunea*, and from galls of *Trypeta gibbosa* on *Ambrosia artemisiæfolia*. It is believed to be hyperparasitic on the Asiatic lady-bird beetle (*Chilocorus similis*).

Tetrastichus Haliday.

°**T. modestus** Howard.

Female: length 1 mm.; mostly shining black, with slight greenish reflections; smooth, without perceptible punctures; flagel and especially the club quite hairy, antennæ brown, with whitish hairs; mesonotum without a median longitudinal sulcus, submarginal vein with two bristles, veins very light brown; all coxæ, femora and tibiæ dark brown, coxæ and femora in some individuals polished black, femoro-tibial articulation and tips of all tibiæ yellowish white, all tarsi yellowish white. Male differs from female only in the longer scape, and longer, more hairy flagel.

Reared from cocoons of *Apanteles edwardsi* on (*Pyrameis*) *Vanessa atalanta*.

°**T. semidiæ** (Packard). *Eulophus semidiæ* Packard.

Female and male: length 1.85 mm.; mostly bluish green; antennæ brown, darker in male than in female; flagel of male with many long appressed hairs; mesonotum with a median impressed longitudinal line, all tibiæ and tarsi honey-yellow, all coxæ dark brown, yellowish at tips, front femora dark metallic except at tips, mid and hind femora dark brown except at tips; abdomen in female a little longer than the thorax and about as broad, rounding out to the third segment, which is broadest, and thence with straight sides tapering to a point, flattened; abdomen of male shorter and narrower than thorax, flattened and suboval.

Reared from *Œneis norna* var. *semidea*.

°**T. racemariæ** Ashmead.

Female and male: length about 2 mm.; mostly aeneous black, smooth; scape of antennæ tawny yellow, flagel black; coxæ and femora black, trochanters and a narrow annulus near bases of tibiæ piceous brown, tibiæ and tarsi yellowish white; wings hyaline, veins yellowish, postmarginal vein wanting.

°**T. productus** Riley.

Female: average length 2.1 mm.; pedicel oval, flagel slightly compressed, funicle joints subequal in size, club ovate, third joint of funicle shorter than first and second, its length exceeding its width but slightly; abdomen flattened dorso-ventrally, prolonged to an acute tip. Male: average length 1.5 mm.; scape somewhat broader below, flagel flattened, hairy, each joint except club with a whorl of long, slender hairs at base, funicular joints subequal in length, rather more than twice as long as wide, head smooth and shining black, with slight metallic reflections, flagel brown; pronotum and mesonotum smooth shining black, metanotum, pro-, meso- and metapleuræ, and all coxæ above, finely punctate, shining black; submarginal vein of front wings with a single superior bristle behind its middle, marginal vein three times as long as stigmal, postmarginal absent; median impressed line of mesonotum very distinct, metanotal carina rather distinct; all trochanters, distal end of all femora, all tibiæ and tarsi, honey-yellow, wing veins brown; abdomen compressed laterally, subacuminate.

Listed as a parasite of the Hessian fly (*Mayetiola destructor*).

°**T. saundersi** (Packard). *Eulophus saundersi* Packard.

Female: length 1 mm.; differs from *semidiæ* as follows: abdomen considerably shorter and thicker, scarcely longer than the thorax; antennæ much shorter, joints between the second and the club longer than broad, brown and hairy; veins much paler, less distinct, trochanters brown, femora brown, pale at base and whitish at tip, tibiæ and tarsi white, except tarsal joints, which are pale brown; abdomen like the rest of the body, deep blue with a greenish tinge, conic-ovate, tip not at all produced.

Reared from the chrysalis of a butterfly of the genus *Thecla*, presumed to be *edwardsi*.

°**T. theclæ** (Packard). *Eulophus theclæ* Packard.

Male: length 1.28 mm.; mostly dark metallic bluish black; antennæ brown, with whitish hairs; mesonotum with a median longitudinal sulcus, submarginal vein with two bristles; all femora and coxæ blue, all tibiæ and tarsi yellowish white, last tarsal joint dusky; abdomen broadly ovate, as long as thorax, but broader than the same.

Reared from a chrysalis of *Thecla calanus*.

°**T. cærulescens** Ashmead.

Female: length 1.5 mm.; mostly steel-blue; scape aeneous, flagel subclavate, brownish black, pubescent, its joints delicately fluted, funicle 3-jointed, the first joint the longest, slightly longer than the second, club fusiform, 3-jointed, a little longer than the two last joints of funicle together, and stouter; tips of femora and the tibiæ and tarsi except last two joints, white, the two terminal joints of tarsi fuscous, the hind tibiæ toward base behind with a brownish blotch or spot; wings hyaline, veins pale brown, abdomen conic-ovate, pointed at tip, a little longer than head and thorax combined. Male: length 1.2 mm.; funicle 4-jointed; abdomen oblong-oval, cylindric, not longer than head and thorax together; otherwise as in female.

Parasitic on *Habrobracon gelechiæ*, a primary parasite of *Canarsia hammondi*.

T. sp.

New Haven, August, 1905 (W. E. B.). Reared from *Baccha fascipennis* or *Phenacoccus acericola*.

°T. sp.

Reared from (*Pieris*) *Pontia rapæ, Diastrophus cuscutæformis*, clover-flower midge (*Dasyneura legumicola*), *Cratotechus orgyiæ, Dibrachys boucheanus*. Possibly a secondary and tertiary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*), with *Cratotechus orgyiæ* and *Dibrachys boucheanus*, respectively, as hosts.

ENTEDONTIDÆ.

Key to Genera.

1. Notauli distinct and complete 2
   Notauli incomplete, at most indicated only anteriorly. Female: abdomen sessile or subsessile, petiole, if present, very short, ovipositor not exserted; wings with marginal cilia, knob of stigmal vein sessile or subsessile; thorax and scutel smooth, impunctate, antennæ 8-jointed, with one ring-joint, not tapering toward apex, joints of funicle submoniliform. Male: abdomen as in female, *i. e.*, sessile or subsessile; wings with marginal cilia; antennæ 7-jointed, or jointed as in the female ....**Pediobius** p. 458
2. Abdomen sessile or subsessile 3
   Abdomen distinctly petiolate 5

3. Antennæ 10-jointed, with one ring-joint, funicle 4-jointed, club 3-jointed 4
Antennæ 8-jointed, with one ring-joint; wings usually with transverse fasciæ, the postmarginal vein not well developed; head wider than long; flagel short, compressed, fusiform, the joints except the last wider than long ...... **Closterocerus** p. 459
4. Wings hyaline, immaculate, the front wings almost glabrous, not very pubescent, the hairs arranged in more or less irregular lines, postmarginal vein not well developed, not or scarcely longer than the very short subsessile stigmal vein; eyes normal; the malar space distinct; head not wider than the thorax in the male; metanotum at most with only a trace of a median carina, smooth and impunctate; abdomen conically produced, as long as or longer than the head and thorax united ....**Omphale** p. 456
Wings banded or with fuscous maculæ, postmarginal vein short, the knot of the stigmal vein petiolate ..**Astichus** p. 457
5. Scutel without a median longitudinal grooved line 6
Scutel with a median longitudinal grooved line; antennæ 9-jointed, the funicle 3-jointed in the females, 4-jointed in the males ....**Horismenus** p. 458
6. Antennæ 9-jointed; scutel never smooth, always punctate, scaly-punctate or reticulate; mesothorax smooth, without lateral carinæ, metanotum with a transverse carina a little before the apex ....**Derostenus** p. 456
Antennæ 10-jointed, with a ring-joint; metanotum with lateral carinæ and a median carina ....**Pleurotropis** p. 457

Derostenus Westwood.

°**D. antiopæ** (Packard). *Entedon antiopæ* Packard. Scudder, Butterflies of New England, Pl. 89, Fig. 7.

Male: body mostly shining black; antennæ with a brown club and funicle; scape, pedicel and ring-joints yellow; scape cylindrical, flagel hairy; eyes slightly emarginate, not hairy; metanotum yellow-brown; scutel without a median groove; postmarginal vein distinct; all legs yellow except perhaps the coxæ, which have not been observed; abdomen rotund, with a yellow-brown petiole.

Reared from (*Vanessa*) *Euvanessa antiopa.*

Omphale Haliday.

°**O. (Euderus) elongatus** Ashmead.

Female: length 2 mm.; mostly bluish black, with dull metallic green, scaly thorax and scutel; vertex of head transversely acute and with the front deeply grooved, antennæ dark brown, scape pale; parapsidal grooves very distinct; tips of tibiæ and tarsi white, except the apical tarsal joints of hind legs, which are brown; wings hyaline, veins yellowish; abdomen sessile.

Parasitic on *Attelabus rhois.*

Pleurotropis Foerster.

°**P. ashmeadi** Crawford.

Male: length 2 mm.; mostly cyaneous, delicately ripple-marked; head broader than thorax, scape yellow except a dusky streak above near the apex, flagel black and hairy; thorax slightly shorter than the abdomen; legs mostly yellow, their coxæ and femora black; wings hyaline, with two transparent bands of brown, veins pale brownish, the postmarginal vein longer than the stigmal; abdomen pointed ovate, its second segment longest, but extending hardly to the middle of the abdomen, sides of the abdomen with some hairs.

This is listed as a tertiary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*) with *Dibrachys boucheanus* as host, as a possible quaternary parasite with the latter species as host, and as a quinquenary parasite of the American tent caterpillar, (*Clisiocampa*) *Malacosoma americana.*

°**P. albitarsis** Ashmead.

Female and male: length 1.5-2 mm.; mostly bluish black, including antennæ; vertex of head aeneous and scaly; mesothorax aeneous and scaly; legs steel blue except tips of tarsi, which are yellowish white; wings hyaline, veins pale brown; abdomen of female pointed ovate, of male, linear.

Astichus Foerster.

°**A. minutus** Howard.

Male: length 1 mm.; mostly shining black; antennæ 10-jointed, light brown, head slightly punctate; surface of thorax smooth and not appreciably punctate; all femora black, light at tips; tibiæ and tarsi yellowish.

Listed as an American parasite of the cosmopolitan scale, *Eulecanium persicæ,* which lives on peach trees.

A. tischeriæ Howard.

This is probably a manuscript name. The species is parasitic on the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

Pediobius Walker.

This genus may be found in the State.

Horismenus Walker.

°**H. popenoei** (Ashmead). *Holcopelte popenoei* Ashmead.

Female: length 2 mm.; head bright cupreous, punctate, flagel concolorous with the head, scape, except at tip, yellowish white; thorax punctate and bright cupreous, including the coxæ; rest of legs yellowish white; wings hyaline, veins pale, scutel delicately scaly; abdomen bluish black, with a faint aeneous tinge at base in certain lights.

Parasite or secondary parasite on the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

°**H. fraternus** (Fitch).

Length: 2.5 mm.; thorax minutely shagreened, brilliant brassy green; submarginal vein of the anterior wings black and united with the margin for two-thirds of its length, stigmal branch conspicuously notched at its apex; abdomen above concolorous with the thorax, its under side black.

Parasite on the white-marked tussock moth (*Hemerocampa leucostigma*).

°**H. euplectri** Howard.

Female: length 1.8 mm.; mostly dark metallic green; scape white or faintly yellowish, face shagreened, postmarginal vein twice as long as the stigmal, veins dark brown; legs white or faintly yellowish; abdomen oval acuminate, with first segment smooth and shining, slightly shagreened posteriorly, succeeding segments shagreened. Male: slightly smaller than the female; head with a strong coppery luster, bluish beneath, scape white, metallic blue at tip; parapsidal grooves not continuous with the scapular grooves; abdomen bright metallic blue, not shagreened; otherwise mostly similar to the female.

Bred from *Euplectrus comstocki*.

Closterocerus Westwood.

°C. cinctipennis Ashmead.

Male: length 1 mm.; mostly blue; antennæ brownish black; pronotum, mesonotum and scutel golden green and strongly punctate; legs brown, except trochanters, tips of tibiæ and tarsi, which are pale or whitish; wings hyaline except for a transverse brown band across the stigmal region and another apical transverse brown band.

°C. trifasciatus Westwood.

Length 1.6 mm.; black; thorax bluish green; front wings each with two arcuate fuscous fasciæ and with the apex fuscous, or with the anterior fascia nearly obliterated; tarsi pale at base; abdomen chalybeous-black.

This is a primary or a secondary parasite of the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

C. tricinctus Ashmead. *Pleurotropis.*

Male: length 1.1-5 mm.; mostly indigo-blue; vertex of head with a black median band, antennæ black; a median black band extending from pronotum to apex of scutel; wings hyaline, pubescent, with three dusky, transverse bands, one beyond the middle, another across the stigmal region, thc third at the apical border; tarsi pale.

Reared from a *Lithocolletis* larva on sycamore.

Female: length nearly 1 mm.; head blackish beneath, metallic bluish with metallic greenish reflections above; thorax colored like the head; legs mostly blackish or very dark, at least the hind tarsi mostly yellowish, apical joints dark brown; abdomen mostly black with bronzy reflections, ovipositor slightly exserted; wings mostly hyaline, their basal half bounded by a faint, somewhat lunate, brownish mark, their basal three-quarters bounded by a more distinct lunate brownish mark, a third lunate brownish mark along the apical edge of the wings.

New Haven.

Bred 10 February, 1904, indoors. On record in Storrs Agricultural Experiment Station Bulletin 45, 1906, as a parasite of the trumpet leaf-miner of the apple (*Tischeria malifoliella*), laying its eggs on the surface of the mines.

EULOPHIDÆ.

Key to Genera.

1. Abdomen petiolate; antennæ inserted far below middle of the face, scape reaching no higher than ocelli; parapsidal grooves not visible, apparently wanting, scutel without dorsal impressed lines, posterior tibiæ evidently with two spurs 2
Abdomen sessile; antennæ in female 8-jointed without a ring-joint, or 9-jointed with a ring-joint; pedicel not longer than wide, antennæ in male 9-jointed, with a ring-joint; head viewed from in front longer than wide; scutel with two dorsal impressed lines or grooves..**Zagrammosoma** p. 462
2. Marginal vein not three times as long as stigmal; male antennæ 3-branched, rarely simple 3
Marginal vein at least three times as long as stigmal; male antennæ simple, funicle 5-jointed ....**Sympiesis** p. 461
3. Thorax not robust; flagel of female antennæ not compressed-fusiform, funicle of female black, of male with long branches ....**Eulophus** p. 460
Thorax very robust ....**Cratotechus** p. 460

Eulophus Geoffrey.

°E. n. sp.

Parasite or secondary parasite on the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

°E. sp.

Host: (*Pyrameis*) *Vanessa atalanta.*

Cratotechus Thomson.

°C. orgyiæ Fitch.

Length 3 mm.; head brassy green; three or four times as wide as long, as broad as the thorax, appearing slightly notched in front when viewed from above; antennæ mostly brown, basal joints yellow; thorax brassy green, finely shagreened, twice as long as wide, broadest across the middle, scutel golden yellow, with an elevated line on each side at its base; legs mostly yellowish white, their tips black; wings mostly clear, a broad glabrous stripe extending along the inner margin of the anterior wings, veins pale; abdomen mostly purplish black, smooth and polished, shorter than the thorax, basal segment above and beneath with an apical yellow band.

Listed as a primary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*).

Sympiesis Foerster.

°**S. nigrifemora** Ashmead. *S. lithocolletidis* Howard MS.

Female: length 2-3.5 mm.; mostly blue, sometimes with a greenish luster, more or less distinct on the head and thorax; antennæ brownish black; legs yellowish except the black or bluish black femora, which latter may have a metallic luster, the coxæ which are blue, the apical joints of the tarsi which are brown; wings hyaline and more often nearly bare, veins pale brown; abdomen pointed ovate, slightly longer than the head and thorax combined.

Reared from balsam leaf-miner, oak leaf-miner, and trumpet leaf-miner of the apple (*Tischeria malifoliella*).

°**S. tischeriæ** Ashmead.

Female: length a little less or more than 2 mm.; mostly metallic bluish green, coarsely squamose, with a few hairs; head smooth, face blue; legs uniformly pale yellowish, except the tips of the apical tarsal joints, which are dusky; abdomen blue, with an aeneous to brassy tinge.

°**S. quercicola** Ashmead.

Female: length 2.5 mm.; mostly blue; antennæ black; thorax scaly, golden green above, except the metathorax, which is blue; legs yellowish white; abdomen with a reddish streak on each side beneath.

Reared from an oak leaf-miner.

°**S. chenopodii** Ashmead.

Similar to the preceding, from which it differs as follows: antennæ mostly black, with a metallic tinge in certain lights, scape pale at base; thorax mostly dull metallic green, smooth and more pubescent, metathorax aeneous: legs whitish, more pubescent; wings more pubescent, stigmal and post-marginal veins brown; abdomen aeneous.

Reared from a *Lithocolletis* miner on *Chenopodium hybridum.*

°**S. dolichogaster** Ashmead.

Female: length 4 mm.; mostly blue, antennæ dark brown; legs mostly pale yellowish white, apical tarsal joints brown; wings hyaline; abdomen twice as long as the head and thorax combined, acuminate.

°**S. nigripes** Ashmead.

Female and male: length a little more than 1 to nearly 2 mm.; mostly aeneous black; metathorax blue, tarsi and knees dull honey-yellow, veins black or pale.

Reared from the trumpet leaf-miner of the apple (*Tischeria malifoliella*) and a *Lithocolletis* on soft maple.

°**S. uroplatæ** Howard.

Male: length 2.6 mm.; mostly metallic green, yellowish beneath; joints of flagel distinct and somewhat flattened; pronotum and mesonotum strongly shagreened, metanotum with a clearly defined, delicate, straight, median carina; hind coxæ coarsely shagreened above, front femora brownish at base, the distal half of the same honey-yellow, mid and hind femora brownish, slightly metallic above, front tibiæ and tarsi nearly white, mid and hind tibiæ and tarsi the same as the anterior in color except a brownish tinge near base of hind tibiæ; veins of the wings dusky; abdomen ovate.

Bred from a mine of *Odontata* (*Uroplata*) *suturalis.*

Zagrammosoma Ashmead.

Hippocephalus Ashmead.

°**Z. multilineatum** Ashmead.

Female: length 2.5 mm.; mostly honey-yellow; last joint of funicle and the club of the antennæ brown, head with black lines as follows: a median one on the face below the insertion of the antennæ, two beneath the eye and one above the latter extending transversely along the sharp edge of the vertex, two on the occiput; thorax above with black lines as follows: two lateral ones extending the whole length of the dorsum of the thorax, a median one extending from the anterior margin to the tip of the scutel; between the latter and the lateral lines the surface between the anterior edge of the mesonotum and the metanotum is divided by a line that meets its fellow at the median line; metanotum with curved lines and a median straight line; wings hyaline, stigmal vein black, other veins pale; abdomen with a median longitudinal black line from which extend about twelve curved lines of black, six on each side.

Bred from the locust Lithocolletis (*Lithocolletis ornatella*), also from the trumpet leaf-miner of the apple (*Tischeria malifoliella*), of which it is either a primary or secondary parasite.

ELASMIDÆ.

Elasmus Westwood.

Tarsi 4-jointed; posterior coxæ strongly compressed; head semiglobose; male antennæ flabellate; submarginal vein not broken, bristly, postmarginal vein distinct, parapsidal grooves either wanting or indistinct; abdomen petiolate, the petiole transverse and smooth.

°**E. nigripes** Howard.

Male: length 1.5 mm.; differs from *varius* in size, and as follows: scutellar spot not so vivid orange color, front coxæ black, femora and tibiæ earthy yellow, with many black hairs that are so numerous on the femora as to obscure the real color, tarsi dusky, mid and hind coxæ, femora, tibiæ and tarsi nearly black, expanse of wings 2.91 mm., greatest width of fore wing 0.27 mm.

Bred from *Lithocolletis gregariella*.

°**E. varius** Howard.

Male: length 1.75 mm.; mostly shining black; head punctate, the impressions more separated on the face, antennæ black, with light hairs; mesonotum covered with fine hairs and appearing as if covered with minute overlapping scales, scutel apparently smooth but really covered with fine wavy lines and hairy near its base, rounded tip of metascutel orange yellow, metascutellar appendage membranous white, rest of metanotum metallic green; front coxæ black at base, rest brownish yellow, femora black, with a metallic luster, and with a longitudinal yellow line beneath, tibiæ yellowish, with a dusky streak above, tarsi dark fuscous, hind coxæ and femora shining black, light at joints, tibiæ dirty yellow, lined above with brown, tarsi blackish; wings 3.30 mm. in expanse, greatest width of anterior wing 0.33 mm., veins dark brown; abdomen acuminate, with some stiff black hairs at apex.

Hosts of this species are: *Campoplex* (*Ameloctonus*) *fugitivus*, *Apanteles hyphantriæ* and *Meteorus xanthocephalus*.

°**E. pullatus** Howard.

Male: length 1.39 mm.; mostly shining black; antennal pits and the immediate region of the mouth parts honey-yellow; all coxæ and femora black, except tips of femora, which are yellow-brown; anterior tibiæ yellowish, tarsi dusky; mid and hind tibiæ at tip yellow-brown, tarsi dark.

Possibly a parasite of the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

°**E. atratus** Howard.

Female: length 1.6 mm.; mostly black and shining; face and vertex with punctures; antennæ with joints of funicle subequal in length and about as long as wide, club slightly flattened; pronotum and mesonotum regularly scaly, with some hairs, scutel finely shagreened and shining, pleuræ and hind coxæ shining, the latter finely scratched, thorax with a faint metallic luster; front and middle tibiæ dusky, rather lighter at base; abdomen smooth, rather longer than the head and thorax combined. Male: differs from female only as follows: antennal branches dusky and reaching to base of club.

Parasitic on *Apanteles hyphantriæ, A. delicatus* and (*Limnerium*) *Campoplex* (?) *validus*.

°**E. tischeriæ** Howard.

Female: differs from *varius* as follows: scape of antennæ light yellow; metanotum metallic green; front coxæ dirty white, tibiæ and tarsi the same, mid and hind coxæ nearly black, honey-yellow at either end; veins slightly dusky, not dark brown; abdomen with its first segment metallic green, with a continuous longitudinal black stripe above, rest of abdomen honey-yellow.

Bred from larvæ of *Tischeria solidaginifoliella*.

ELACHERTIDÆ

Key to Genera.

1. Abdomen with a more or less distinct petiole 2
Abdomen subsessile 4
2. Prothorax subconical 3
Prothorax acute ....**Euplectrus** p. 467
3. Posterior tibiæ with two spurs; body not metallic; scutel without dorsal lines ....**Miotropis** p. 465
Posterior tibiæ with one spur; scutel with two dorsal lines; body with at least the head metallic ....**Elachertus** p. 466

4. Body metallic, winged ....**Cirrospilus** p. 465
Body not metallic; wings short or wanting.....**Melittobia** p. 465

Melittobia Westwood.

Anthophorabia Newport.

°**M.** sp.

Bred from *Anthophora, Osmia, Chalicodoma, Stelis, Anthidium, Bremus, Hylæus, Odynerus, Vespula, Trypoxylon, Monodontomerus* and *Leucospis*.

Miotropis Thomson.

°**M. megachilis** (Packard). *Anthophorabia megachilis* Packard.

Female: length 1 mm.; body, including antennæ, mostly blackish brown; head flattened posteriorly, front rounded ovate, vertex slightly angulated, clypeus transversely oblong, antennæ 9-jointed, club 3-jointed; thorax flattened, pronotum longer than wide, triangular, mesonotum trapezoidal, scutel oblong, twice as long as wide, postscutel transversely oblong, metanotum shorter than wide; legs uniformly pale testaceous honey-yellow, tarsi 5-jointed; abdomen flattened, oblong ovate; ovipositor slightly exserted.

Bred from *Megachile, Ceratina, Anthophora* and *Monodontomerus*.

°**M. clisiocampæ** Ashmead.

Female: length 1.5 mm.; mostly black, polished; scape, pedicel, and first joint of funicle pale yellow, rest of flagel black; scutel and metathorax light brown or yellowish; wings hyaline, stigmal and postmarginal vein equal in length; legs, including coxæ, pale yellow; abdomen orbicular, a little wider than the thorax.

Bred from (*Clisiocampa*) *Malacosoma americana* on apple.

Cirrospilus Westwood.

°**C. flavicinctus** Riley.

Male: length 1.3 mm.; mostly bright yellow; antennæ 7-jointed, the articulations, especially at base of pedicel, black with a metallic blue reflection, scape as long as the three following joints combined, ring-joints wanting, club rather longer than the preceding joint; thorax finely scaly above, marked with black with metallic blue reflections; abdomen with a yellow band. Female: length 1.6 mm., differs from the male in having only a mesonotal yellow spot, a narrow yellow line around inside of eyes, and the legs yellow except hind coxæ, femora above, and tips of tarsi; antennæ mostly yellowish brown with black scape; thorax with a distinct bluish hue.

Bred from *Bucculatrix pomifoliella,* and possibly a parasite or secondary parasite of the trumpet leaf-miner of the apple (*Tischeria malifoliella*).

°**C. niger** Howard.

Female: length 1.5 mm.; mostly shining black, with black bristles; antennæ yellowish beneath; anterior border of pronotum, mesonotum and scutel finely shagreened, metanotum sculptureless, with a very fine median longitudinal suture anteriorly and a corresponding carina posteriorly; legs, including coxæ, honey-yellow; abdomen yellowish beneath at base, lozenge-shaped or nearly round, as broad as, but shorter than, the thorax.

Reared from the pupæ of some unknown *Eulophus* parasitic on (*Pyrameis*) *Vanessa atalanta.*

Elachertus Spinola.

Elachistus Foerster.

°**E.** n. sp.

Parasitic on the lesser peach borer (*Synanthedon pictipes*).

°**E. cacœciæ** Howard.

Male: length 1.9 mm.; mostly shining black; face subtriangular, cheeks nearly straight, scape whitish beneath, dark brown above, flagel dark brown, pubescent with whitish hairs, mandibles light reddish brown; mesonotal and scutellar furrows not continuous, interrupted by the angle of the scapulæ; postmarginal vein much longer than the stigmal; legs yellowish white, hind coxæ slightly darker at base; first and second dorsal abdominal segments with a yellowish brown spot extending nearly to the lateral edges, abdomen beneath at base light brown.

Bred from nest of *Cacœcia rosaceana.* Parasite of *Cratætechus orgyiæ.*

°**E. proteoteratis** Howard.

Female: length 1.8 mm.; mostly dark metallic green; head broadly oval, cheeks well rounded, scape nearly white, flagel light ochreous, mouth-parts nearly white, mandibles shining brown at tips; mesonotum transversely shagreened, scutel finely coriaceous, metathoracic carina delicate; legs yellowish white, except the hind coxæ, which are brownish near the base; abdomen elliptical, its petiole cylindrical, rugose, basal half of dorsum of abdomen with a bright straw-colored blotch bounded by brown and ending posteriorly in a straight transverse line, abdomen beneath with a longitudinal honey-yellow stripe, wider anteriorly than posteriorly.

Bred from larvæ of *Proteoteras æsculana.*

Euplectrus Westwood.

°**E. comstocki** Howard. Howard, Insect Book, p. 58, Fig. 32; p. 58, Fig. 33; p. 59, Fig. 34.

Male: length 1.8 mm.; mostly black; antennæ with third to seventh joints inclusive oval, subequal in length; head smooth, antennæ ochreous; mesonotum with many transversely elongate punctuations and with a delicate longitudinal carina; scutel and remainder of thorax smooth; middle tibial spur as long as first and second tarsal joints combined; legs ochreous, veins fuscous; abdomen with an ochreous area of varying size.

Parasitizes the cotton worm (*Aletia xylina*) and the fall army worm (*Laphygma frugiperda*).

°**E. frontalis** Howard.

Female: length 2 mm.; differs from *catocalæ* chiefly as follows: yellow spot on the face including the bases of the antennæ, cheeks below this point black to the base of the mandibles, pronotum punctate except at its posterior border, mesonotum coarsely shagreened, its median carina faint, metascutel longitudinally striate.

Reared from a noctuid larva on walnut.

°**E. catocalæ** Howard.

Female and male: length 2.3 mm.; differs from *comstocki* chiefly as follows: larger; face with a yellow spot extending to base of antennæ; metascutel longitudinally striated; abdomen in male with an ochreous blotch occupying all of the anterior half of the dorsum, beneath yellow except at its tip; abdomen in female above with an ochreous spot, oval in form, on the anterior center, bounded on all sides by dark brown beneath as in the male.

Bred from the larvæ of a species of *Catocala* and from a larva of a geometrid on birch.

°**E. plathypenæ** Howard.

Female: differs from *comstocki* chiefly as follows: length 1.67 mm.; face entirely black; pronotum distinctly shagreened, mesoscutel only slightly roughened, median carina distinctly visible; legs dark honey-yellow, hind coxæ quite dark at bases; abdomen yellow above and beneath except for a narrow band of black around the edge. Male: somewhat smaller than the female; scape with a leaf-like expansion beneath, otherwise similar to the female.

Bred from a larva of *Plathypena scabra*. Listed as an American parasite of a cosmoplitan insect.

PTEROMALIDÆ.

Key to Genera.

1. Anterior femora enlarged 18
Anterior femora not enlarged 2

2. Posterior tibiæ 1-spurred; head very large, broad, excavated in front, with two acute tubercles on each side **Cratomus** p. 483
Posterior tibiæ 1- or 2-spurred; head not especially large.. 3

3. Anterior edge of clypeus acutely bidentate in the middle; marginal vein of anterior wings often thickened 4
Anterior edge of clypeus not bidentate; marginal vein not at all or very slightly thickened; wings with the stigmal club always quite pronounced; posterior tibiæ 1-spurred.... 6

4. Anterior wings with a delicate marginal vein; abdominal petiole punctate above, longer than wide 5
Anterior wings with a thick marginal vein; abdominal petiole shorter than the posterior coxæ; parapsides not distinctly defined ....**Pachyneuron** p. 481

5. Abdominal petiole longer than posterior coxæ; male palpi normal; head with compressed cheeks; parapsides not plainly defined; second and third abdominal segments very large ....**Sphegigaster** p. 483
Abdominal petiole not longer than posterior coxæ; second abdominal segment deeply emarginate; male palpi abnormal; vertex of head acute in the middle; parapsides indistinct ....**Cyrtogaster** p. 482

6. Antennal club not subulate 7
Antennal club subulate in female or conico-acuminate in male; metathorax punctate, without a fold, without a spiracular sulcus 16

7. First funicular joint of antennæ rarely abruptly smaller than the others 8

First funicular joint of female antennæ abruptly smaller than the others, funicle thick, antennæ inserted almost in the middle of the face, which is impressed with large punctures; thorax above smooth, metathorax very short; ovipositor exserted ....**Roptrocerus**

8. Antennæ inserted below the middle of the face, stigmal club not distinct, vertex medially not acute, cheeks round, left mandible 3-, right 4-dentate, club of male antennæ blackish, head with narrow vertex, ocelli in female with the posterior pair nearer the anterior one than to each other; thorax short, metathorax with distinct lateral folds, marginal vein one and one-half times as long as the stigmal; abdomen not rotund ....**Eutelus** p. 478

Genera differing from *Eutelus;* head often triangular and with prominent eyes, clypeus without an apical tooth, but sinuate or truncate at apex; pronotum often not at all or only slightly defined, wings with a small or medium-sized stigmal club 9

9. Pronotum broad 10

Pronotum narrow; mandibles 3-dentate ....**Psilocera** p. 470

10. Head with the vertex sometimes medially acute; eyes not hairy 11

Head with cheeks bulging, vertex not acute medially, eyes not prominent, first funicular joint of antennæ longer than pedicel; pronotum broad, sternal groove obsolete, metathoracic spiracles usually large, oval; left mandible 3-dentate ....**Hetroxys (Habrocytus)** p. 478

11. First funicular joint large 12

First funicular joint small ......**Pteromalus (Meraporus)** p. 478

12. Metathorax with a large subglobose neck; flagel filiform; abdomen in female ovate-acute; postmarginal vein longer than stigmal 13

Metathorax usually with a very small neck, postmarginal vein often shorter than stigmal, very rarely longer; abdomen in female usually rotund 14

13. Wings entirely pubescent, neck of metathorax smooth; cheeks concave ....**Pteromalus (Catolaccus)** p. 476

Wings not entirely pubescent, but with a large clear spot; neck of metathorax punctate; mandibles usually 4-dentate, antennæ often inserted below the middle of the face, ring-joint distinct; metathorax usually punctulate and furnished with a carina; abdomen often rotund, never produced at apex in the female ....**Pteromalus** p. 471

14. Postmarginal vein shorter than stigmal or as long as the same 15

Postmarginal vein longer than stigmal, neck of metathorax short; abdomen oval-rotund; vertex broad .... **Pteromalus (Psychophagus)** p. 475

15. Abdomen oblong; vertex medially acute .... **Pteromalus (Dibrachys)** p. 475

Abdomen rotund; cheeks compressed, acute; wings hyaline, postmarginal vein shorter than stigmal .... **Pteromalus (Cœlopisthus)**

16. First funicular joint as long as the following 17

First funicular joint short; rim of metathorax with large punctures; all coxæ rufous ......**Merisus (Micromelus)** p. 479

17. Abdomen subcylindrical; third segment short....**Merisus** p. 478

Abdomen subovate, dorsally often flattened .... **Merisus (Phænacra)** p. 479

18. Posterior tibiæ with two spurs, wings banded, marginal vein not thickened 21

Posterior tibiæ with one spur, marginal vein of anterior wings thickened; antennæ with transverse ring-joints; body cyaneous; stigmal vein longer than marginal; female with antennal club stylate at apex ....**Raphitelus** p. 483

21. Eyes not hairy; anterior femora exciso-dentate, posterior tibial spurs arcuate; wings with two transverse bands.... **Chiropachys** p. 484

Eyes hairy, abdomen sessile, pointed; postmarginal vein longer than marginal, stigmal one-third the length of the marginal ....**Epistenia** p. 484

Psilocera Walker.

Metopon Walker.

°**P. rufipes** Ashmead.

Female: length 1.8-3 mm.; mostly dull bronzy green to bluish black and black, closely punctate and with a whitish pubescence; scape, pedicel, ring-joints, more or less of the first funicular joint, and the mandibles rufous or brownish, flagel brownish black; metanotum with a median carina intersected at its basal third by a transverse carina which is usually very distinct, although sometimes nearly obsolete, the ridge of the metapleuræ bluish black; wings hyaline or sometimes with a slight fuscous tinge, pubescent, tegulæ and veins ferruginous or brownish yellow, the marginal vein nearly twice as long as the stigmal; abdomen aeneous, ovate, compressed, much narrower than the thorax, carinate beneath, the ventral valve yellowish and extending beyond the upper tip of the abdomen; petiole rugose, fourth segment shorter than third, the following segments subequal. Male: length 1.8-2 mm.; differs from the female chiefly as follows: abdomen oblong, sometimes with a yellowish spot at base, second segment about half as long as the abdomen, third segment only half as long as the first, fourth and fifth scarcely half as long as the third.

Bred from *Chlamys plicata.*

Pteromalus Swederus.

°**P. puparum** Linnæus. Scudder, Butterflies of New England, Vol. iii, Pl. 89, Figs. 1, 2.

Female: length 1.3-4 mm.; head a little broader than the abdomen, transverse, greenish bronze, closely punctate, slightly narrower behind the eyes, vertex emarginate in the middle, ocelli equidistant from each other or nearly so, face rather flat, antennal grooves inconspicuous, cheeks convex, slightly compressed, eyes subovate, subconvex, clypeus emarginate at apex in the middle, mandibles with four acute teeth, the apical one distinctly sinuate, antennæ thread-like, inserted in the middle of the face close together, brown or fuscous, scape, however, linear and yellow, second joint oblong, third distinct, fourth a little larger than third, fifth to tenth joints equal in width but subequal in length, club in the form of an elongate cone; thorax slightly convex above, almost smooth, with adjoining umbilicate punctures, metanotum punctate, without a median carina but with arcuate lateral folds, spiracles suboval, and in the spiracular suture; wings hyaline, subcostal cell broad, marginal vein longer than stigmal and a little shorter than post-stigmal; coxæ green, femora fuscous bronze, tibiæ occasionally concolorous; mesopleuræ delicately puncate; abdomen ovate, flat above, convex beneath, its sides rounded, a little shorter than the thorax, considerably broader, its first segment dark blue and hidden. Male: differs from female chiefly in its thinner, more pilose antennæ, oblong abdomen, which is golden above, green head, which is broader than the thorax, and femora and tibiæ which are always yellow.

This species is most beneficial, inasmuch as it may destroy as many as ninety per cent. of the injurious common cabbage worm or cabbage butterfly, (*Pieris*) *Pontia rapæ*. It is on record as having been bred also from the following: (*Vanessa*) *Euvanessa* *antiopa*, (*Colias*) *Eurymus philodice*, (*Terias*) *Eurema lisa*, *Agraulis vanillæ*, (*Grapta*) *Polygonia satyrus*, (*Pyrameis*) *Vanessa atalanta*, (*P.*) *V. cardui*, (*Limenitis*) *Basilarchia archippus*, *Campoplex* (*Ameloctonus*) *fugitivus*, *Aleiodes*, *and Microbracon*. It has been seen ovipositing on a larva of (*Eudamus*) *Epargyreus tityrus* by C. V. Riley.

P. puparum var. vanessæ Harris. Scudder, Butterflies of New England, Vol. iii, pl. 89, Fig. 3.

Differs from *puparum* in being at least one-fourth larger, and darker in color.

Listed as an American parasite of a cosmopolitan insect. Bred from (*Grapta*) *Polygonia interrogationis*, (*G.*) *P. comma*, (*Vanessa*) *Euvanessa antiopa*, (*Pieris*) *Pontia monuste*, *Papilio palamedes* and *P. thoas*.

***P. verditer** Norton.

Female: mostly bluish green; antennæ 13-jointed, rather clavate, first to fourth joints inclusive yellow, rest dark, pilose; head green, prothorax green, rest of thorax bluish green; coxæ all green, sometimes the middle portion of femora green, rest of legs yellow with exception of the apical tarsal joints, which are blackish; base of abdomen bluish green, its apical half purplish bronze: abdomen polished. Male: mostly bright green; antennæ pale yellow except at apex; legs pale green; abdomen with a yellow band around the middle.

°**P. nematicidus** Packard. Rept. Entom. Com., U. S. Dept. Agric., 1883, Pl. xiii, Fig. 5.

Bred from *Lygæonematus erichsoni*. The illustration cited above is the only descriptive matter extant concerning this species.

Listed as an American parasite of a cosmopolitan insect.

°**P. cuproideus** Howard.

Female: length 3.5 mm.; mostly brownish green; scape rufous, funicle dusky, third antennal joint as long as fourth and fifth combined, sixth and seventh longer than third, apical joint conical, head uniformly punctate; thorax punctate like the head, metanotum with a median longitudinal carina and two curved lateral carinæ; legs, including coxæ, light honey-yellow; tegulæ darker honey-yellow; basal two-thirds of second dorsal abdominal segment blue or purplish, second segment occupying a little more than one-third of the dorsal extent of the abdomen. Male: differs from the female in its yellowish antennæ with black scape, and in being somewhat brassy.

Reared from the white-marked tussock moth (*Hemerocampa leucostigma*).

°P. chionobæ Howard.

Female: length 3 mm.; mostly bronzy green; clypeus bidentate in the middle at apex, antennæ inserted somewhat below middle of face, flagel pubescent with white hairs, scape honey-yellow, pedicel honey-yellow beneath, eyes smooth; metanotum with a complete median carina, its spiracles distinct, spiracular sulcus plain, but not reaching the socket of the metathorax, neck of metathorax punctate, border of socket smooth, with a row of punctures over it; postmarginal vein equal in length to the stigmal vein; femora brown, tibiæ and tarsi lighter toward tip; abdomen smooth, ovate.

Bred from a chrysalis of (*Chionobas*) *Œneis norna* var. *semidea*.

°P. archippi Howard.

Female: resembles *puparum* var. *vanessæ* in size and color, with the following exceptions: all femora honey-yellow instead of dark brown or metallic; median carina of metanotum faintly indicated, spiracular sulci much curved and reaching about half-way to the socket of the metathorax.

Bred from the chrysalis of (*Danais*)*Anosia plexippus*.

°P. gelechiæ Webster.

Female: length 2.5-3 mm.; club of antennæ darker than in the male; femora also darker than in the male; spine on inner side of middle pair near apex longer than in male; abdomen more acutely triangular than in male; ovipositor not exserted when not in use, reddish brown; abdomen not fuscous at base. Male: length 2 mm.; head broader than thorax, antennæ slightly clavate, pubescent, second joint longer than first, fifth not as broad as sixth, but broader than fourth, and as long as both ring-joints combined; head closely punctate, steel-blue, antennæ fuscous; thorax longer than wide, its parapsidal furrows distinct, mid femora with a slender spine on inner side near apex; thorax steel-blue, anterior and mid femorà scarcely darker than tibiæ, which are fuscous, posterior femora dusky, tarsi rather lighter than tibiæ; veins of the wings light brown, stigmal vein half as long as marginal and less than one-fourth as long as submarginal; abdomen smooth, shining, black at tip, cordate, sessile, and obtusely triangular.

Listed as an American parasite of the cosmopolitan Angoumois grain-moth (*Gelechia cerealella*), from the larvæ of which the type specimens were reared.

P. (Hypopteromalus) tabacum Fitch.

Length 2.5 mm.; mostly dark green, with a brassy reflection; head about three times as broad as long, finely shagreened, eyes dull red in life, brown in death, ocelli equidistant or nearly so, mandibles yellow, but brown at tip, 4-dentate, palpi dull white, antennæ inserted in the middle of the face, subclavate, brown except the first joint, which is dull pale yellow, pubescent, apparently 9-jointed, second joint the smallest, but little longer than thick, and obconic in form, third joint three times as long and nearly three times as thick as the preceding, and pear-shaped, ring-joints two in number, fourth and succeeding joints nearly equal and square in outline, apical joint about three times as long as the one preceding it, and oval or subovate in form, rounded at base and pointed at apex, and possibly 3-jointed; thorax scarcely as wide as the head, three times as long as wide, parapsidal grooves present; legs pale wax-yellow, except the tarsi and ends of the tibiæ, which are dull white, and the posterior femora, which are black with their tips pale yellow and the outer aspect greenish blue, tarsi 5-jointed and dusky at tips; wings transparent, veins brown or brownish; abdomen one-third shorter than the thorax and in life thicker than the thorax, egg-shaped, convex, with its tip acute, smooth, polished, greenish black, the middle segments each with a broad purple-black band; abdomen black beneath.

Listed as an American parasite of the cosmopolitan insect *Calandra oryzæ*.

Reared from *Phlegethontius,* New Haven, September, 1909 (A. I. Bourne).

°**P.** sp.

Hosts: (*Grapta*) *Polygonia progne and* (*Melitæa*) **Euphydryas phaeton.*

°P. sp.

Parasitic on *Ameloctonus, Aleiodes intermedius,* and *Habrobracon gelechiæ.*

°**P. (Dibrachys) boucheanus** Ratzeburg, U. S. Dept. Agric., Div. Entomology, Bull. 5, Technical Series, 1897, p. 35, Fig. 18.

Female: length 1 1/6-1 1/4 mm.; head and thorax mostly greenish, and as closely reticulately punctate as possible; scape dark testaceous, rest of antennæ dark brown; legs, except coxæ, which are concolorous with thorax, mostly pale testaceous; abdomen practically entirely blackish, with a greenish tinge, especially at base above. Male flagel not twice as long as the scape; colors more constant than in female. In some female individuals part of the scape is dark. The hind legs may be more or less infuscated in this species.

This is at times a very abundant hyperparasite of the gipsy moth (*Porthetria dispar*), the white-marked tussock moth (*Hemerocampa leucostigma*), the American tent caterpillar (*Malacosoma americana*), and *Hyphantria.* It has been bred from species of *Apanteles,* (*Limnerium*) *Campoplex* (?) *validus, Campoplex* (*Ameloctonus*) *fugitivus, Hemiteles,* (*Bathythrix*) *pimplæ,* (*Pimpla*) *Scambus* (*Iseropus*) *inquisitoriellius,* (*P.*) *Scambus* (*Itoplectis*) *conquisitor, Meteorus communis, M. hyphantriæ, Paranomalon, Microbracon, Aleiodes intermedius, Theronia fulvescens,* and possibly *Spilochalcis debilis.*

°P. (D.) sp.

Bred from *Apanteles clisiocampæ* and *Habrobracon gelechiæ.*

P. (Psychophagus) omnivorus Walker. *Diglochis* Foerster.

Female: length 1-1.7 mm.; greenish aeneous, partly shining; fuscous; legs fulvous, except coxæ, which are greenish, femora, which are mostly fuscous yellow apically, tarsi, which are pale fulvous, and the pulvilli and claws, which are fuscous; abdomen mostly aeneo-cupreous, first dorsal segment rich greenish, fulvescent, with its apex cupreous, pale. Male: greenish, shining; mouth fulvous, antennæ mostly fulvo-fuscous, first joint fulvous, except its apex, which is dusky; legs, except coxæ, mostly yellow, apex of tarsi fulvous, claws and pulvilli fuscous; tegulæ and veins mostly yellow; wings hyaline; abdomen maculated with yellow; otherwise practically as in the male. Color variable.

Bred from the American tent caterpillar (*Malacosoma americana*). Stonington, June, 1913 (W. E. B.)

♣°**P. (Catolaccus) anthonomi** Ashmead. Insect Life, Vol. v, 1893, p. 185, Fig. 17.*

Female: length 2.8 mm.; mostly blue; head and thorax faintly tinged with metallic green; flagel brown, scape honey-yellow; head confluently punctate, front impressed, clypeus sinuate at the middle; antennæ 13-jointed, inserted on the middle of the face, scape about one-half as long as the flagel, pedicel smaller than the first joint of the flagel, joints of the flagel almost equal in length and thickness; thorax ovoid, confluently punctate, prothorax rounded, parapsidal grooves present only anteriorly, metathorax two-thirds the length of the scutel, its spiracles close to the postscutellar fold and elliptic-oval, lateral folds complete, and a slight median carina at base; wings hyaline, veins pale yellowish, stigmal vein two-thirds as long as the postmarginal; trochanters, tips of femora, tibiæ and tarsi honey-yellow, coxæ and femora mostly bluish, hind coxæ punctate, the inner ridge with pubescence; abdomen conic-ovate, about as long as the rest of the body combined, subsessile, first, fifth, sixth, and seventh dorsal segments about equal in length and together about as long as the second, third, and fourth combined, second and third together only slightly longer than the fourth. Male: length 2 mm.; golden green; scape and legs, except hind coxæ and femora, yellow, tips of hind femora also yellow; flagel pale brown, pubescent, pedicel smooth and dusky, joints at end of funicle slightly longer than thick, the joints at its base one and a half times as long as thick; abdomen oblong-oval, first and fifth segments longest, remaining segments about equal in length.

Probably parasitic upon *Anthonomus signatus.*

°**P. (C.) cerealellæ** Ashmead.*

Female: length 2-2.5 mm.; mostly metallic bronzy green, closely punctate and sparsely pubescent; scape and labial palpi honey-yellow, rest of antennæ dark fuscous; first joint of funicle as long as the pedicel or a little longer, following joints subequal to the club, the apical joint a little wider at base than at apex, at least the first and second joints of the club wider than long; head wider than the thorax, about three and one-half times as wide as thick antero-posteriorly, thinnest at the middle; meta-

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* *Habrocytus* or *Zatropis*, according to M. W. Kurdjumov.

thorax impressed on each side posteriorly, and usually with a median carina on the middle lobe at base; wings hyaline, veins light brown or brownish yellow; legs metallic green, knees, tibiæ, and all except the apical joint of the tarsi honey-yellow; abdomen conic-ovate, usually a little longer than head and thorax combined, first and second, or first, second, and third segments tinged with cupreous, the abdominal segments subequal in length and with some fine transverse scratches. Male: length hardly 2 mm.; mostly bronzy black; flagel thread-like, densely hairy; abdomen oblong-oval, not jointed at apex, and with a yellow median spot at base.

Bred from *Sitotroga cerealella* Olivier.

°P. (C.) **incertus** Ashmead.[*]

Female: length 2 mm.; head and thorax metallic green, confluently punctate and covered with rigid white hairs; flagel subclavate, brown, first funicular joint longest, and about one and one-half times as long as wide, remaining joints subequal, the last very little longer than wide, club 3-jointed, a little shorter than the funicle, its second joint longest and widest; head a little wider than the thorax, hind ocelli nearer to the anterior ocellus than to each other, clypeus emarginate medially; thorax ovoid, prothorax distinct, mesonotum wider than long, with parapsidal furrows apparent anteriorly, scutel convex, metathorax half as long as the scutel, punctate, with a median carina at base and oval spiracles close to the postscutellar fold, the surface behind them depressed, with no lateral folds; wings hyaline, veins brownish yellow, stigmal vein clavate and about one-half the length of the marginal, its club brown, marginal vein two-thirds as long as the submarginal vein, the postmarginal one-half again as long as the stigmal vein; trochanters, apices of femora, and tibiæ and tarsi, mostly honey-yellow, hind tibiæ dusky at the middle; abdomen conic, subcompressed, bluish black, as long as the head and thorax combined, first and third body segments about equal in length and slightly longer than any of the others. Male: length 11 mm.; mostly dull bluish or blue-black, sometimes with a slight bronzy tinge on the head and thorax above, rigid pubescence subobsolete; second abdominal segment, scape, knees, tips of tibiæ and tarsi except apical joint, honey-yellow or whitish yellow; flagel brown and covered with pubescence, pedicel stouter than, and about twice as long as the first funicular joint, the succeeding joints equal, and a little longer than thick, club pointed and usually not as thick as the funicle.

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[*] *Habrocytus* or *Zatropis*, according to M. W. Kurdjumov.

Bred from *Anthonomus signatus*.

°**P. (Meraporus) calandræ** Howard.

Male: length 1.15 mm.; head and thorax steel-blue, abdomen yellow-brown at base, black and shining at tip; head somewhat broader than thorax, antennæ subclavate, somewhat pilose, fifth joint as long as the two ring-joints combined, scape fuscous, flagel nearly black; thorax nearly as broad as long, parapsidal grooves hardly indicated; all femora dark brown, tibiæ lighter, tarsi nearly white, apical joint darker; veins yellow-brown, stigmal vein as long as the marginal and half as long as the submarginal; abdomen cordate, sessile, smooth and shining; head and dorsum of thorax punctate, and with many white hairs.

Listed as an American parasite of the cosmopolitan *Calandra oryzæ*, from the pupa of which it has been bred. Also bred from another beetle injurious to stored grain, *Sitodrepa panicea*.

°**P. (Habrocytus) thyridopterygis** Howard. U. S. Dept. Agric., Div. Entomology, Bull. 5, Technical Series, p. 35, Fig. 17.

Has been bred from the bags of the bag worm and from the white-marked tussock moth, of which latter it is possibly a tertiary parasite, with *Hemiteles* (*Allocota*) *thyridopterygis* as host.

Eutelus Walker.

°**E. onerati** Fitch. The Oak-Bullet Gall Parasite.

Female: length somewhat more than 2.5 mm.; mostly brilliant cupreous, with green reflections; antennæ mostly dark brown, their first joint pale yellowish; legs sulphur-yellow. Male: length 2.5 mm.

Bred from galls of *Callaspidia globulus*.

Merisus Walker.

M. isosomatis Riley. *Stictonotus isosomatis*.

Female: length 3.25 mm.; mostly metallic green and sparsely covered with white hairs; antennæ subclavate, pilose, head finely punctate, antennæ mostly black, club brownish; pro- and mesothorax rather closely punctate; anterior coxæ and their femora metallic green, distal end of femora, all of anterior tibiæ and tarsi except claws, honey-yellow; mid coxæ metallic green, mid femora mostly black with both ends yellowish, mid tibiæ honey-yellow with a longitudinal dorsal streak, mid tarsi, except apical joint, honey-yellow; hind legs with their coxæ, femora and tibiæ shining black, with the distal end of femora and both ends of tibiæ honey-yellow, their tarsi honey-yellow except the apical joint, which is black; veins honey-yellow; abdomen very delicately shagreened. Male: antennæ more clavate; nearly devoid of white hairs except at tip of mesonotum and at tip of abdomen.

Bred from *Isosoma tritici.* Also reared from *Isosoma* infesting timothy grass at the Experiment Station in New Haven.

°**M. (Phænacra) chalcidiphagus** (Walsh). *Semiotellus chalcidiphagus* Walsh.

Female: length 2.25-3 mm.; mostly blue-black or dark indigo-blue; head finely and confluently punctate and scarcely polished; antennæ pale rufous, darker toward base, flagel not pubescent, the joints of the latter indistinctly separated; thorax sculptured like the head; legs black, with the tibiæ and tarsi, except tips of the latter, pale rufous, tibiæ occasionally basally clouded with black externally; wings hyaline, front wings with a dark smoky area extending backward from the subcostal vein where that vein first touches the costa to the tip of the branch, but not quite to the hind edge of the wing; veins brown, much paler toward the base of the wing; abdomen almost sessile, depressed, flattened above, rounded below, polished, with a few short whitish hairs toward the tip, in color less blue than head and thorax, and with cupreous reflections beneath. Male: differs from the female chiefly as follows: flagellar joint pubescent and distinctly separated, first and second joints of antennæ rufous, third to ninth joints dark brown; abdomen subpetiolate, narrower, its tip acute, cupreous tinge stronger; front wings without a dark smoky cloud; length 2-2.5 mm.

Bred from barley galls.

°**M. (Micromelus) destructor** Say *M.* (*Bæotomus*) *destructor.*

Black, with bluish green metallic reflections; legs black banded with yellow; female a little longer than the male, and otherwise different as follows: antennæ somewhat clavate, the funicular joints increasing slightly in width and decreasing slightly in length from the first to the sixth, club obliquely acuminate, scape light yellow-brown in color, flagel brown, with the club lighter in color than the rest of the flagel; pubescence shorter and finer.

Male: average length 1.90 mm.; antennæ filiform, distinctly pilose, joints of the funicle subequal in width, decreasing slightly in length from the first to the sixth, first joint a little more than twice as long as broad, club nearly as long as the two preceding funicular joints together, ovate, flattened laterally and acuminate at tip; head densely and rather finely punctate, black, with a metallic bluish green reflection; scape yellowish, pedicel and flagel brown to blackish; thorax mostly concolorous with the head, and similarly punctate, the scutel and metanotum with the punctures finer than those on the head, pronotum, and mesonotum, those on metanotum deeper, metanotum with an indication of a median carina; hind tibiæ with a single apical spur, hind trochanter with two tooth-like projections beneath; all coxæ black with metallic reflections, all femora black or dark brown with yellowish tips, all tibiæ and tarsi honey-yellow; wings hyaline, their veins very distinct and dark brown; abdomen oval, convex above, flattened beneath, glabrous but very finely shagreened, mostly black, with a yellowish spot above and beneath at base.

Parasitic on the Hessian fly. Listed as an American parasite of a cosmopolitan insect.

°**M. subapterus** (Riley). *Homopterus subapterus* Riley.

Female: length 1.8-2.8 mm.; differs from the male as follows: antennæ more clavate, sixth funicular joint slightly broader than long, flagel always black with a metallic tinge, pedicel usually tipped with black at its distal end; pubescence shorter and finer than in the male; femora and tibiæ in general of a darker brown, in which case the knees and distal third of tibiæ are whitish; metallic luster of thorax more subdued; wings, when present, hyaline, veins faintly tinged with yellowish, spurious veins very faint; abdomen notched when seen from the side.

Male: wingless; length 1.58-2.74 mm.; antennæ inserted a little below the middle of the face and close together, but still distinctly separated, flagel pilose, its club oval-acuminate, flattened laterally, funicular joints subequal in length, first joint a trifle longer than broad, the following joints increasing in width to the sixth, which is as wide as long; posterior ocelli nearer to the anterior ocellus than to each other; head distinctly broader than thorax, densely and finely punctate, with a greenish metallic luster, bulbs of antennæ black, scape and pedicel honey-yellow, flagel yellowish brown and often with a darker metallic tinge, especially at the sutures; thorax mostly concolorous with the head, and similarly punctate on the pro- and mesonotum; all legs honey-yellow except coxæ, which are slightly metallic at base, and tarsi and sometimes distal end of tibiæ, which are whitish; abdomen ovate, acuminate, glabrous, mostly black.

Listed as an American parasite of the cosmopolitan Hessian fly, from the final larva of which it has been bred in Missouri.

Pachyneuron Walker.

***P. nigrocyaneum** (Norton). *Chiropachys nigrocyaneus* Norton.

Length 2.5 mm. Female: mostly dark blue-black, varying to purple; head wider than thorax, antennæ 13-jointed; the first and second joints together nearly as long as the rest combined, yellow, scape blackish, third joint not much shorter than fourth or fifth; prothorax transversely narrower than rest of thorax; legs yellow, except coxæ, which are black; abdomen polished, flattened, oval-triangular.

Bred from the cocoons of *Diprion abietis* and *D. simile*.

Type locality: Connecticut. New Haven, 1915 (W. E. B.).

°**P. apidivorum** Ashmead.

Female: length 1 mm. or a little longer; head metallic green, suffused with purple and purplish black on vertex, shagreened, the sculpture coarser between the eyes; mandibles tridentate, antennæ brown, pubescent, scape and pedicel darker; thorax purplish black with bronzy and cupreous reflections, with a reticulate sculpture, scapulæ golden green, scutel convex, rounded, metathorax wrinkled; wings hyaline, iridescent, pubescent except at base, their veins pale yellow, the marginal vein brownish, stigmal vein slightly longer than the marginal, with seven long hairs along outer edge; legs pale yellowish, coxæ black, anterior and middle femora dusky near base above and beneath, at least for two-thirds of their length; abdomen flat, oval, blue-black, metallic at base, and with bronze tingings toward apex, darker beneath.

Listed as an American parasite of the cosmopolitan plant louse, *Aphis brassicæ.*

°**P. micans Howard.** Howard, Insect Book, p. 56, Fig. 29.

Female: length 1.28 mm.; metallic bluish, greenish or bronzy black; antennæ metallic, funicle as long as width of head, first funicular joint as long as broad, not compressed, the succeeding joints increasing gradually in width but not in length, to the club, which is oval, compressed, and nearly as long as the three preceding joints combined, funicle with appressed hairs; head delicately shagreened; mesonotum finely punctate, not pointed, coxæ metallic, all femora metallic on the outside, tipped with dull yellow, tibiæ honey-yellow, tarsi somewhat dark, last joint brown; abdomen flat, oval, nearly as broad as thorax. Male differing from the female as follows: antennæ longer, pubescence of funicle longer, more erect, and dirty white instead of silvery; abdomen much narrower than thorax; femoral bands brown, hind tibiæ with a light brown central band.

Bred from *Siphonophora avenæ.*

°**P. altiscuta** Howard.

Body mostly shining blue, length 2 mm.; head about one-half as long as the thorax, antennæ light in color and as long as thorax, 13-jointed, first joint curved, as is the second, the latter enlarging toward tip, third and fourth small, fifth to tenth equal in size and length, last three constituting club, which tapers to tip; thorax as long as abdomen; costal vein of front wings broken, just beyond the break decidedly broader to the branch, which is as long as the broad portion and knobbed; costal vein of hind wings with an angle at the middle which points forward, the wings very hairy except at base, where they are nearly bare, hairs at margin coarser than elsewhere; legs light in color, except femora, which are dark; abdomen peduncled; female and male very similar.

Cyrtogaster Walker.

°**C. dineutis** Ashmead.

Female: length 2.5-2.65 mm.; mostly bronze-green, confluently punctate; palpi fuscous, mandibles piceous or rufo-piceous, scape and pedicel brownish yellow, flagel black or brown-black; head wider than thorax, a little more than three times as wide as thick antero-posteriorly; clypeus with some fine converging striæ, antennæ 13-jointed, inserted a little below the middle of face, flagellar joints beyond first wider than long; thorax with the parapsidal grooves indicated only anteriorly, metanotum with a carina above; wings hyaline, apical two-thirds pubescent, the basal one-third bare, marginal and postmarginal veins nearly equal in length, about one-third longer than the stigmal, the latter ending in a stigma or thickening; legs, except coxæ, brownish yellow; abdomen ovate, attached to the produced portion of metathorax by a distinct petiole.

Bred from the pupa of *Dineutes assimilis,* of which it is probably only a secondary parasite.

Sphegigaster Spinola.

S. n. sp.

Bred from pupæ of *Odontocera dorsalis,* New Haven, 1894 (W. E. B.).

Cratomus Dalman.

°**C. megacephalus** Fabricius.

Mostly black; tibiæ yellow; wings white, with a median fuscous mark; abdomen shining.

°**C. leucophthalmus** Ashmead.

Male: length 2.5 mm; mostly blue-black, confluently punctate; head, measured from eye to eye, nearly twice as wide as thorax, a broad groove extending from the eye obliquely toward the mouth; eyes finely pubescent; antennæ 13-jointed, clavate; scape, pedicel, and first and second funicular joints brownish yellow, the following joints brown; legs red except the trochanters, extreme tips of femora and tibiæ, and all of the anterior tibiæ, which are brownish yellow; wings hyaline, with a fuscous blotch across the middle, veins rufo-piceous, submarginal vein distant from costal edge and nearly three times as long as the marginal vein, stigmal vein about as long as the marginal, postmarginal distinctly longer than the stigmal; abdomen oval, with a bronzy tinge and a yellow petiole.

Raphitelus Walker.

°**R. maculatus** Walker.

Male: mostly green; antennæ black except first joint, which is yellow tipped with fuscous, and second joint, which is fuscous;

legs mostly pale fuscous, coxæ green, trochanters yellow, mid and hind tarsi straw color, their apex fuscous; wings subhyaline, subcosta of front wings maculated with fuscous, veins usually fuscous; abdomen cyaneo-cupreous, shining, glabrous, aenous green at base.

Listed as an American parasite of the cosmopolitan fruit-bark beetle (*Scolytus rugulosus*).

Epistenia Westwood.

This and the following genus are referred to a separate family, the Cleonymidæ, in Ashmead's classification.

°**E. osmiæ** (Ashmead). *Dasyglenes osmiæ* Ashmead.

Female: length 6 mm.; cyaneous, coarsely pitted, brownish pubescent; flagel brown; legs dark red, pubescent, femora infuscated; wings hyaline, veins brown.

Reared from a mason bee, *Osmia*, living in catalpa twigs.

Chiropachys Westwood.

°**C. colon** Linnæus.

Female: head and thorax deeply punctate, dull cupreous, slightly tinged with green; antennæ dark brown, first and second joints ochreous; wings iridescent, anterior ones each with two dark brown spots (one near the center, the other near the tip) passing through the furcate vein, these spots not so large as in the male, and varying in size; legs ochreous, the mid and posterior femora shaded pitchy; size variable; abdomen smooth and shining, dark cyaneous black, tinged with dark green, its basal segments brighter green, its apex slightly pubescent. Male: may be larger than the largest female; color of thorax varying from bright green to obscure blackish green.

Listed as an American parasite of the cosmopolitan fruit-bark beetle (*Scolytus rugulosus*).

SPALANGIIDÆ.

Key to Genera.

Body very slightly metallic; frenum not discernible; mesothorax submetallic, polished, metathorax strongly punctate ....**Cercocephala** p. 485
Body metallic; frenum large, distinct; antennæ inserted in the anterior margin of the oblong head ....**Spalangia** p. 485

Cercocephala Westwood.

C. sp.

Attacks wood-boring larvæ of the beetle family Scolytidæ.

Spalangia Latreille.

°S. **drosophilæ** Ashmead.

Female: length 2 mm.; mostly shining, blue-black; head flattened, covered with coarse, distant punctures, with a longitudinal median groove and a triangular projection at tip, sparsely pubescent, antennæ 10-jointed, issuing from the extreme tip of the head; prothorax elongated, scutel with a transverse row of punctures posteriorly near the tip, metathorax with two longitudinal grooves and with a double row of coarse punctures on its disk, the punctures behind confluent; legs clavate, black, pubescent, tarsi pale or reddish; wings hyaline; abdomen petiolate.

Bred from the larva of a species of *Drosophila* or pomace-fly.

°S. **rugosicollis** Ashmead.

Female: length 2.5 mm.; mostly blue-black, mesonotum and scutel aeneous; head and prothorax with a large impunctate polished space anteriorly, but rugoso-punctate posteriorly; parapsides and scutel with some sparse round punctures, mesopleuræ smooth and with a median fovea; legs mostly concolorous with most of body; tarsi, except apical joint and claws, reddish yellow; scutel with a transverse row of punctures before tip, metathorax carinated down the middle, the space on each side of the carina rugoso-punctate; wings hyaline, veins brown, marginal vein a little more than half the length of the submarginal, postmarginal and stigmal veins about equal in length and three times as long as thick; abdomen oval, petiolate, the petiole longitudinally striated.

°S. **hæmatobiæ** Ashmead.

Female: length 2 mm.; mostly blue-black and highly polished, impunctate except a small oval space on the mesonotum just in front of scutel; parapsides metallic; head smooth, with a central longitudinal groove, mandibles and palpi black, antennæ 10-jointed, subclavate, black, pedicel twice the length of first funicular joint, the second joint of the funicle a little shorter than the first, the following joints to the club quadrate in outline, club seemingly fused, and about as long as the three preceding joints combined; prothorax about twice the length of the mesonotum, polished, except the neck-like portion, which is finely rugose; scutel smooth, with a transverse subapical impressed line, postscutel with a row of round punctures back of it, metathorax as long as scutel, tricarinate, smooth and shining; legs mostly like rest of body, posterior femora æneous, tarsi fuscous above, with short dense pale pubescence beneath; wings hyaline, strongly iridescent, veins black, marginal vein more than two-thirds the length of the submarginal, postmarginal and stigmal equal, about three times as long as thick.

Bred from the larva of the horn-fly (*Hæmatobia serrata*).

°S. sp.

Parasite on dipterous larvæ.

TRIDYMIDÆ.

Antennæ inserted at the middle of the front, clypeus not produced, both ring-joints visible, or only one.

Key to Genera.

1. Notauli complete 2
   Notauli not complete .... **Hemadas** p. 487
2. Wings ciliate at apex .... **Semiotellus** p. 486
   Wings not ciliate .... **Systasis** p. 486

Semiotellus Westwood.

°**S. suborbicularis** Provancher.

Female: length a little over 2 mm.; metallic blackish brown above; scape yellowish black; legs honey-yellow; wings hyaline, grayish, veins nearly colorless; abdomen depressed, polished, nearly circular, with a small point at apex.

Systasis Walker.

°**S. diplosidis** Eckel.

Female: length 3.5 mm.; mostly metallic blue-green, with the blue predominating; head three times as wide as long, rather confluently punctate, shagreened between the punctures, lateral ocellus as far from the eyes as from the median ocellus; antennæ black except at base, twice as long as the head is high, scape yellow, one ring-joint present, joints of flagel equal in length and gradually increasing in thickness, except the first, which is twice as long as the others, and the last, which is more or less triangular; prothorax much more finely punctate than the head, especially beneath, rest of thorax rugulosely punctate, with the punctures separated; wings hyaline, marginal vein twice as long as the stigmal and one and one-half times as long as the postmarginal, under side of thorax and coxæ green, shagreened; legs mostly honey-yellow, femora brownish, as are all the apical tarsal joints; abdomen blue-green, polished, slightly longer than the thorax; body throughout sparsely pilose with white hairs.

Bred from *Diplosis resinicola* on *Pinus rigida*.

Hemadas Crawford.

°**H. nubilipennis** (Ashmead). *Megorismus nubilipennis* Ashmead.

Female: length 2.75 mm.; shining, mostly blue-black and almost sculptureless; scape reddish brown; legs mostly reddish brown, the posterior femora infuscated or slightly bluish, the tarsi pale; wings hyaline, with a large brown blotch enclosing the marginal vein and stigma, veins brown, the marginal vein about twice as long as the stigmal vein, which is toothed, the submarginal vein interrupted by a pale ring at the juncture with the marginal; abdomen flattened.

Bred from the galls of *Solenozopheria vaccinii*.

APHELINIDÆ.

Key to Genera.

1. Tarsi 5-jointed, or seemingly only 4-jointed owing to the fusion of the ultimate and penultimate joints; antennæ 5-jointed, funicle 1-jointed, ring-joints two..**Eretmocerus** p. 490
   Tarsi 4-jointed 2
2. Anterior wings with an obliquely transverse hairless line below stigma; antennæ 6-jointed; ovipositor not, or only slightly, exserted; wings hyaline, or with a slight fuscous patch, eyes not hairy ....**Aphelinus** p. 489
3. Antennæ 8-jointed 4
   Antennæ 7-jointed; club 1-jointed; exserted portion of ovipositor about one-half as long as the abdomen; stigmal vein squarely truncate at apex ....**Ablerus** p. 490
4. Club 2-jointed, hind tibiæ not armed with stiff black bristles **Encarsia** p. 489

Club 3-jointed; stigmal vein present, marginal cilia of wings shorter than or about as long as first joint of anterior tarsi, marginal vein as long as or longer than the submarginal; flagel subcylindrical; hind tibiæ not flattened, and with a row of short bristles above, but normal..**Coccophagus** p. 488

Coccophagus Westwood.

Key to Species.

1. Females: wings hyaline 2

Males 6

2. Mostly black; hind border of dorsum of thorax black, head not coarsely punctulate 3

Mostly moderately bright yellow; tip of scape and all of flagel, border of pronotum, tip of tegulæ, border of metanotum, and incomplete bands between abdominal segments, fuscous, as are the veins of the wings. Length 8 mm. ....**fletcheri**

3. Tegulæ black 4

Tegulæ brown; nearly all of scutel and postscutel yellow. Length 1.3 mm. ....**flavoscutellum**

4. Scutel with apical half yellow 5

Scutel yellow only at tip, all tibiæ brown, except a yellow area at either end. Length 0.78 mm. ....**fraternus**

5. Punctures of dorsum of thorax arranged in longitudinal rows; front and middle tibiæ yellow. Length 1 mm. ....**lecanii**

Punctures of dorsum of thorax not arranged as in *lecanii*; all tibiæ dark. Length 1.2 mm. ....**cognatus**

6. Body entirely black; mesonotum, exclusive of the scapulæ, sparsely punctate, hind edge of mesonotum not bordered by a regular row of round punctures 7

Body not entirely black, but mostly brown; scutel tipped with yellow; mesonotum, except scapulæ, irregularly sparsely punctate. Length 0.6 mm. ....**cognatus**

7. Tegulæ brown, all tibiæ and tarsi yellow; hind tibiæ occasionally with a dusky patch near base. Length about 0.5 mm. 8

Tegulæ black, all tibiæ dark brown in the middle and whitish at either end. Length somewhat less than 0.78 mm. **fraternus**

8. Scutel dark ....**lecanii**

Scutel usually entirely black, sometimes yellow at extreme tip ....**flavoscutellum**

°C. **fletcheri** Howard.

Parasitic upon ***Lecanium fletcheri.***

°C. **cognatus** Howard.

Listed as an American parasite of ***Lecanium fletcheri, L. hesperidum, L. cerasifex*** and ***L. persicæ.***

°**C. fraternus** Howard.

An American parasite of *Lecanium persicæ.*

°**C. lecanii** Fitch.

Recorded as an American parasite of the cosmopolitan *Lecanium hesperidum.*

°**C. flavoscutellum** Ashmead.

Parasitic upon the same host as the preceding species.

Encarsia Foerster.

Key to Species.

Females.

1. Tarsi of middle legs 4-jointed, fourth and fifth joints apparently coalescent 2

Tarsi of middle legs distinctly 5-jointed; club of antennæ not flattened, first funicular joint not swollen, pedicel and first funicular joint subequal in length, first and second funicular joints also subequal in length, flagellar striations barely discernible; anterior wings with a round bare space below the stigma. Length 0.58 mm. ......**pergandiella**

2. Pedicel and first funicular joint subequal in length. Length 0.63 mm. ....**luteola**

Pedicel longer than first funicular joint, which is shorter than the second Length 0.66 mm. ....**quaintancei**

E. luteola Howard.

New Haven, 14 August, 1906. Bred from *Aleyrodes coryli* (W. E. B.).

°**E. quaintancei** Howard.

Reared from a species of *Aleyrodes* on *Polygonum.*

°**E. pergandiella** Howard.

Bred from a species of *Aleyrodes* on *Xanthium strumarium.*

Aphelinus Dalman.

Key to Species.

1. Eyes not hairy; mostly yellow; pedicel one and one-half times as long as thick 2

Eyes hairy; head jet black, rest of body mostly black. Length about 1.2 mm. ....**mali**

2. Club of antennæ three times as long as penultimate joint. Length 0.55-0.78 mm. 3

Club of antennæ twice as long as penultimate joint. Length about 0.65 mm. ....**mytilaspidis**

3. Scutel not pointed at base, but normal 4
Scutel pointed at base. Length 0.55 mm. ....abnormis

4. Anterior wings with only a faint cloud beneath stigma. Length 0.78 mm. ....diaspidis
Anterior wings with a distinct cloud occupying all of the central portion, and accentuated below stigma and at its proximal border. Length 0.6 mm. ....fuscipennis

°**A. mali** Haldeman.

Parasitic on the woolly apple aphis (*Schizoneura lanigera*), *Glyphina eragrostidis, Aphis brassicæ, A. monardæ, Pemphigus fraxinifolii, Siphonophora rosæ.*

°**A mytilaspidis** Le Baron. U. S. Dept. Agric., Rept. Entomologist, 1880, Pl. 23, Fig. 1.

Listed as an American parasite of *Diaspis carueli, Lepidosaphes ulmi* and *Chionaspis pinifolii.*

°**A. abnormis** Howard.

Probably an aberration of the preceding species. Bred from *Lepidosaphes ulmi.*

°**A. diaspidis** Howard. U. S. Dept. Agric., Bull. 1, Technical Series, Fig. 7.

Listed as an American parasite of *Diaspis rosæ, Lepidosaphes* on an orchid, and an undetermined *Sycaste* from Japan.

°**A. fuscipennis** Howard.

Reared from the San José scale (*Aspidiotus perniciosus*), *Chionaspis euonymi, Lepidosaphes gloveri, L. ulmi,* and from a species of *Aspidiotus* on *Acacia longifolia.*

Eretmocerus Haldeman.

°**E. corni** Haldeman. U. S. Dept. Agric., Bull. 1, Technical Series, Fig. 2 (antennæ).

Eyes hairy, antennal club of female oar-shaped.

Bred from *Aleyrodes corni.*

Ablerus Howard.

°**A. clisiocampæ** Ashmead. *Centrodora clisiocampæ* Ashmead. U. S. Dept. Agric., Bull. 1, Technical Series, Fig. 14.

Length 0.7 mm.; exserted portion of ovipositor 0.18 mm. long; mostly black, and somewhat metallic; thorax above with a greenish luster, abdomen appearing bluish; antennæ mostly black, second and fourth funicular joints silvery white, apical three-fourths of club light brown, with a rather silvery tinge; legs mostly dark brown, front wings mostly infuscated.

Bred from the scurfy scale (*Chionaspis furfura*) and a species of *Aspidiotus* on pear and apple. Apparently erroneously said to have been bred from the eggs of *Malacosoma americana.*

ENCYRTIDÆ.

Key to Genera.

1. Females 2
Males 15
2. Funicle more than 4-jointed 3
Funicle 4-jointed, mandibles bidentate, face with a distinct carina between antennæ at their insertion, front minutely shagreened and with minute scattered punctures, scape cylindrical, flagel at most subclavate; anterior wings with the marginal vein twice as long or more than twice as long as the stigmal, postmarginal vein mostly longer than the stigmal, stigmal vein very oblique, subclavate .... **Meromyzobia** p. 493
3. Funicle 6-jointed, face not angled; scape, funicle and club not flattened; scutel without grooves 4
Funicle 5-jointed .... **Rhopus** p. 493
4. Scutel three-cornered, with or without rounded tip 5
Scutel crescent-shaped, wings rudimentary .... **Bæocharis** p. 494
5. Scutel with a bunch of hair at tip 6
Scutel without a bunch of hair at tip 7
6. Pedicel shorter than first funicular joint; mesothorax without silvery hairs, marginal vein shorter than stigmal.... **Comys** p. 494
Pedicel longer than first funicular joint; mesothorax with silvery hairs, marginal vein at least at long as the stigmal **Chiloneurus** p. 496
7. Head without very large umbilicate punctures 8
Head with very large umbilicate punctures; wings clear, marginal vein wanting or very short .... **Bothriothorax** p. 497
8. Club of antennæ obliquely truncate 9
Club of antennæ not obliquely truncate; wings developed; scutel arched and with a smooth tip 11
9. Facial groove very pronounced 10
Facial groove slight .... **Homalotylus** p. 500
10. Pedicel three or more times as long as it is thick at apex.. **Litomastix** p. 503
Pedicel not three times as long as it is thick at apex........ **Copidosoma** p. 498

11. Mesthorax lusterless, with dense, fine, clearly defined umbilicate punctures 12
Mesothorax more or less lustrous 13

12. Funicular joints thicker than long; marginal vein wanting.. **Aphycus** p. 501
First to fifth funicular joints longer than thick; marginal vein present ....**Blastothrix** p. 502

13. Anterior wings ciliate; apical funicular joint not five times as long as wide 14
Anterior wings not ciliate; sixth funicular joint five times as long as wide ....**Psilophrys** p. 503

14. Marginal vein one and one-half times as long as the stigmal, scapulæ meeting in a carina; antennæ longer than the body **Leptomastix** p. 503
Marginal vein much shorter than in *Leptomastix;* scapulæ not meeting in a carina; pedicel not three times as long as thick, club thicker than the funicle ....**Encyrtus** p. 504

15. Funicle 6-jointed, the joints not triangular; mesothorax without an impression before tegulæ 16
Funicle 4-jointed, antennæ 11-jointed, simple, not branched, front as in the description of female above, clypeus not carinate; otherwise much as in the description of the female given above ....**Meromyzobia** p. 493

16. Each funicular joint with two half whorls of hairs 17
Each funicular joint hairy, but without half whorls of hairs 20

17. Marginal vein shorter than stigmal 18
Marginal vein longer than stigmal; mesothorax with silver hairs that are close together, scutel usually with a bunch of upright spiny hairs at tip..................**Chiloneurus** p. 496

18. Head and dorsum of thorax not thickly covered with large round punctures 19
Head and dorsum of thorax thickly covered with large round punctures ....**Bothriothorax** p. 497

19. Wings with long cilia; head and thorax very finely shagreened and lustrous; body flat ....**Rhopus** p. 493
Wings with short cilia; body finely punctate, lusterless .... **Blastothrix** p. 502

20. Scutel without a bunch of hairs; funicle not or but slightly compressed 21
Scutel with a bunch of erect black hairs before its tip .... **Comys** p. 494

21. Head and mesothorax with thick and sharp round punctures 25
Head and mesothorax not thus sculptured 22

22. Mesothorax moderately or strongly lustrous, and usually with distinct sculpture; marginal vein usually shorter than the stigmal, seldom as long, or wings rudimentary 23
Mesothorax lusterless and apparently sculptureless when seen under a low power lens; face delicately arched, pedicel longer than the first funicular joint ....**Aphycus** p. 501

23. Wings developed; head not much punctate, usually with a few scattered punctures or impressions near the eyes.. 24
Wings rudimentary; scutel arched, not reaching the abdomen **Bæocharis** p. 494
24. Head lengthened below the eyes, trapezoidal when seen from in front .... **Psilophrys** p. 503
Head not lengthened below the eyes, round or oval when viewed from in front .... **Encyrtus** p. 504
25. · Pedicel three or more times as long as it is thick at apex.. **Litomastix** p. 503
Pedicel not three times as long as it is thick as apex ...... **Copidosoma** p. 498

Meromyzobia Ashmead.

°**M. maculipennis** (Ashmead). *Ericydnus maculipennis* Ashmead.

Male: length 3-3.1 mm.; mostly brownish yellow; head wider than thorax, its surface microscopically shagreened and with a few scattered punctures; ocelli equidistant, the lateral ones nearly touching the eyes, antennæ subfiliform; thorax convex, shining, with sparse microscopic pubesence, pronotum subtriangular, its posterior margin triangularly emarginate, mesopleuræ posteriorly dark brown; scutel dark brown, twice as long as wide at base, axillæ meeting at base, a triangular piece before tegulæ honey-yellow, mesothorax blue-black; legs, except sometimes the mid tibiæ outwardly, and the hind femora and tibiæ except the basal third of latter, which are fuscous, honey-yellow; tibial spur of mid legs as long as the first tarsal joint thereof; anterior wings fuscous except two triangular, nearly confluent hyaline spots at the middle, and the basal third, which is hyaline; abdomen oblong-ovate, as long as the thorax, and blue-black.

Bred from a wheat stem maggot (*Meromyza* sp.), and from *Chlorops ingrata.*

Rhopus Foerster.

°**R. coccois** (E. A. Smith). *Acerophagus coccois* E. A. Smith. U. S. Dept. Agric., Rept. Entomologist, 1880, Pl. 24, Fig. 2.

Female: length .055 mm.; mostly yellow; head darkest, funicular joints subequal in length, first and second joints slightly shorter, all increasing in width from first to fifth, club as long as funicle, indistinctly 3-jointed; wings hyaline, veins colorless.

Listed as an American parasite of the cosmopolitan *Pseudococcus aceris.*

Bæocharis Mayr.

°**B. marlattii** Ashmead.

Female and male: length 0.5-0.75 mm.; thorax nearly as broad as long, mostly shining black, with some aeneous tingeings in certain lights. Male: head much broader than thorax. Female: head much thicker antero-posteriorly than in the male; eyes converging in front, antennæ inserted just above the mouth, apparently only 6-jointed, but really 10-jointed, joints of the club very closely soldered together, scape not reaching much beyond middle of face and lying in a facial groove, pedicel longer than wide, third joint longer than wide; scutel convex; legs mostly brown; knees, tips of tibiæ, and all of tarsi honey-yellow; abdomen sessile, broadly oval, with the first segment longest.

Bred from a greenhouse aphis.

Comys Foerster.

°**C. bicolor** Howard. U. S. Dept. Agric., Rept. Entomologist, 1880, 1881, p. 362, Pl. 23, Fig. 3.

Female and male: length 1.75 mm.; mostly yellow-brown; cheeks below eyes blackish, palpi black, scape silvery beneath, black above, flagel black, with many short black hairs; prothorax shining black, rest of thorax with black hairs, scutellar tuft thick, black, and apparently arising in two longitudinal, closely approximated rows; anterior femora white beneath, fuscous above, especially toward knee, their tibiæ and tarsi dark brown; mid femora white beneath, fuscous above, their tibiæ, tarsi and tibial spurs brownish yellow; posterior legs with the femora and tibiæ dark brown, nearly black, base of first tarsal joint black, rest silvery; distal two-thirds of wings dusky, with a hyaline wedge-shaped band at the end of the marginal vein; at the junction of the subcostal vein with the costa a broad, clear, hairless band extends back across the wing; a fringe of dark hairs upon the subcostal makes an abrupt downward bend at a little over one-half its length and becomes the proximal border of the hairless space for a little over one-half the wing width; abdomen shining black and with sparse long black hairs.

Parasitic upon *Lecanium hesperidum* on ivy. Listed as an American parasite of a cosmopolitan insect.

°**C. fusca** Howard.

Female: length 2.6 mm.; face punctate, yellowish brown, vertex dusky, cheeks blackish, mouth-parts dusky, scape and pedicel honey-yellow beneath, brown above, flagel blackish, with black hairs; prothorax ochreous, mesonotum between the parapsidal grooves, and tegulæ, ochreous, the latter blackish at tip, scapulæ ochreous, densely and finely punctate, axillæ and scutel ochreous, with yellow hairs anteriorly and the tuft black, metanotum black, except postscutel, which has an ochreous tinge; wings as in the preceding species except that the markings are clearer and more distinct, the veins black, except at the transverse clear spot, and the stigmal vein more curved; front coxæ transparent and whitish, their femora, tibiæ and tarsi honey-yellow; mid and hind coxæ yellowish, blackish at tips, mid femora yellowish, slightly darker above, their tibiæ almost black, yellowish at tip, middle spurs and middle tarsi yellowish, claws blackish, hind legs with femora and tibiæ nearly black, their tarsi whitish, except apical joint; abdomen shining black, pedunculate.

Male: similar to female except as follows: scapulæ dusky, prothorax black above, brownish yellow beneath, mesonotum between parapsidal grooves blackish in the middle, ochreous at sides.

Bred from a species of *Lecanium* on laurel-leaved oak.

°**C. albicoxa** Ashmead.

Female: length nearly 2 mm.; head and thorax ferruginous and with pubescence, finely transversely sculptured, and with some large, widely separated punctures on the head; palpi black; antennæ 11-jointed, pubescent; scape slightly curved and slightly dilated, white except at tip; pedicel and following joints black, each joint flattened and gradually widened toward club; prothorax black, mesothorax, scutel and pleuræ microscopically longitudinally strigose, scutel with a tuft of black bristles arranged in two rows toward tip; all coxæ pure white; anterior legs with their femora white, their tibiæ honey-yellow, brownish at tips, their tarsi yellowish white; mid legs with their femora, tibiæ and tarsi honey-yellow; hind legs with their femora, tibiæ and tibial spurs dark brown, their tarsi, except basal portion of first joint, white, their claws dusky; wings brown, with a white transverse band below the stigma; abdomen black or blue-black, brassy beneath, and with a few hairs along the sides.

Male: very like the female, but the antennal joints are not gradually widened toward the tip, the extreme tip of the club is sometimes white or pale, the mesothorax is slightly depressed, and the abdomen is more decidedly blue.

This is on record as an American parasite of the cosmopolitan *Pseudococcus citri*. Also bred from *P. adonidum*.

Chiloneurus Westwood.

°C. **swezeyi** Ashmead.

Female: length 1.5 mm.; head brownish yellow above, temples and cheeks pallid or whitish; thorax beneath pallid or whitish, mesosternum with a black streak, mesonotum with silvery pubescence, scutel bright rust-red, with a tuft of black bristles at apex; front wings hyaline toward base, apical two-thirds fuscous, and with a purplish iridescent spot at lower apical corner; abdomen, especially above, blackish or dark brown.

Male: length 0.8-1 mm.; color nearly as in female, except that the thorax is more whitish at sides and beneath; the scutellar tuft sometimes absent; the head smaller, the legs yellowish, the trochanters and bases of femora white, the mid femora and tibiæ, except a pale basal annulus, more of a brownish yellow, the latter with blackish pubescence outwardly, the tarsi pale, the wings clear.

Probably a primary parasite on *Ormenis*.

°**C. albicornis** Howard. U. S. Dept. Agric., Rept. Entomologist, 1880, Pl. 13, Fig. 4.

Female: length 1.8 mm.; head bright ferruginous, pedicel of antennæ twice as long as wide, dark brown at base, scape dark brown, apex of pedicel and succeeding joints except club snow-white, club black, much flattened, oval, and as long as the four preceding joints combined; pronotum, mesonotum between parapsidal grooves, and scapulæ, ferruginous; scutel blue-black, with many fine silvery hairs that are close together; metanotum black, front legs blackish above, yellowish beneath, their tarsi yellowish brown; mid legs with their femora dark brown, but light toward tips, their tibiæ white, tibial spurs and tarsi yellowish; hind legs dark brown, but with their tarsi yellowish; anterior wings with a central dusky patch and with an excurved hairless band at the distal border of the patch; just below the marginal vein is a hairless line extending obliquely upward and bordered by inward-directed hairs; at distal end of stigma and postmarginal vein is a transverse clear line, extending one-fourth the distance across the wing; all veins brownish, marginal very dark, stigmal almost obsolete; abdomen acuminate at tip, black, with many black hairs; ovipositor yellow-brown.

Probably parasitic on *Lecanium* on pine. Bred from *Lecanium fletcheri*, *L. caryæ*, *L.* sp. on *Quercus aquatica*, and *Kermes* sp. on oak.

°C. **diaspidinarum** Howard.

Female: length 0.93 mm.; mostly shining black; vertex, cheeks, pleuræ, and abdomen with metallic bluish reflections; vertex shagreened, antennæ mostly brown, tip of pedicel and all of fifth and sixth funicular joints dirty yellow, first funicular joint shorter than pedicel and about as long as broad, second, third and fourth joints slightly shorter than first, but about as broad, fifth and sixth much wider, wider than long, club flattened, oval, as long as the four preceding joints combined, scape cylindrical; mesonotum with silvery pubescence, scutel rounded, densely shagreened above, smooth behind, tuft of bristles compact but not erect; front coxæ and all tarsi except apical joint, light yellowish; wings colorless, with marginal cilia, marginal vein as long as or a little shorter than stigmal, postmarginal equal in length to the stigmal; abdomen flat, ovipositor very slightly exserted.

Bred from female scales of *Lepidosaphes ulmi.*

°C. **dactylopii** Howard.

Female: similar to female of *C. formosus* Boheman. Male: marginal vein only slightly longer than the stigmal vein.

On record as an American parasite of the cosmopolitan common mealy-bug (*Pseudococcus citri*).

Bothriothorax Ratzeburg.

°B. **noveboracensis** Howard.

Female: length 1.6 mm.; body mostly bright metallic blue-green; antennæ with their scape honey-yellow at base, brown toward tip, flagel brown, first funicular joint one-half as long as the pedicel, second to sixth joints increasing somewhat in width, club obliquely truncate and as long as the two preceding joints combined; eyes faintly hairy; axillæ well separated at tips, nearly smooth, scutel faintly emarginate at tip, tegulæ smooth, light brown at tip, somewhat metallic at base, a marked depression at central hind border of mesonotum, mesopleuræ smooth; all legs mostly honey-yellow, front and mid femora brownish, hind tibiæ black, all coxæ metallic; veins of the wings brown; abdomen faintly shagreened.

°**B. peculiaris** Howard.

Female: length 1.75 mm.; mostly blue-green; antennæ with their joints not well defined, scape not reaching to top of head, its basal half honey-yellow, its distal half black above, yellowish beneath, flagel black, and with dense black hairs, pedicel twice as long as thick, longer than first funicular joint, funicular joints subcylindrical, increasing in diameter from first to sixth, the sixth as long as thick, club much flattened, somewhat sharply obliquely truncate at tip and as long as the three preceding joints combined; scutel uniformly punctate; anterior wings slightly ciliate at tip; anterior femora black with green luster, yellow at tip, mid and hind femora honey-yellow, front and mid tibiæ honey-yellow, hind tibiæ somewhat compressed laterally and black, all tarsi honey-yellow.

Male: differs from female in the antennæ, which are much longer and more slender, in the first funicular joint being three times as long as thick and one-third longer than the pedicel, in the club, which is only nearly as long as the two preceding joints combined, and in the antennæ and front femora being honey-yellow throughout.

Bred from a syrphid larva on an oak leaf.

Copidosoma Ratzeburg.

°**C. gelechiæ** Howard.

Female: length 1.5 mm.; head black with purplish reflections, antennæ nearly black throughout, pedicel as long as first funicular joint, its tip yellowish, club obliquely truncate at apex, and as long as the five preceding joints combined, joints of the funicle gradually decreasing in length from the first to sixth, punctures of head nearly round; mesonotum between parapsidal grooves bright golden green and with longitudinally lengthened punctures; axillæ subdued golden green, with transverse scratches toward tip, broader near base; scutel very dark brownish green, longitudinally scratched, scutel especially narrow down the median portion; tegulæ concolorous with the scutel; pronotum concolorous with the head; all coxæ dark green, front and mid legs entirely honey-yellow, hind femora dark green except tips, which are yellow, hind tibiæ mostly yellow, with a dark band around proximal third, tarsi yellow; abdomen smooth and shining, and with a greenish luster; ovipositor slightly exserted.

Male: length 1.6 mm.; antennal club slightly longer than sixth funicular joint, pedicel nearly as thick as long, first joint of funicle nearly three times as long as pedicel; head, pronotum, and mesonotum between the parapsidal grooves bright golden green, axillæ and scutel a shade less brilliant; all legs nearly black throughout, with a greenish luster and with yellowish knees, middle tibial spur and first tarsal joint yellow, rest of mid tarsi and all joints of anterior and posterior tarsi blackish; otherwise nearly as in the opposite sex.

Bred from larvæ of *Gelechia gallæsolidaginis.*

°**C. intermedium** Howard.

Female: length 1.25 mm.; differs from the preceding species as follows: antennæ black; mesonotum between the parapsidal grooves with only slightly longitudinally elongated punctures behind, punctures of scutel subaciculate longitudinally, but not so sharp, punctures of axillæ nearly round; front legs dark brown throughout; mid legs with their femora dark brown, with a light brown shade near bases of tibiæ, most of their tibiæ, their tibial spurs and their tarsi light yellow; hind legs with greenish femora, their tibiæ dark brown, yellowish at tip, and their tarsi yellow.

Male: nearly as in the opposite sex, with the following exceptions: punctures of vertex rather transversely elongate, those of mesonotum between the parapsidal grooves broader, narrower in the center; flagel of antennæ strongly flattened, first joint of funicle three times as long as the pedicel and much wider, antennæ brown, scape darker than flagel; head, pronotum, scutel and axillæ with a strong bluish green luster; anterior and mid femora and tibiæ dark brown with yellowish tips, posterior femora and tibiæ nearly black with a greenish luster, yellow only at joints, anterior and posterior tarsi brown, middle tarsi yellow.

Bred from larvæ of *Gelechia gallæasterella.*

C. turni Packard. Scudder, Butterflies of New England, Vol. iii, 1889, Pl. 89, Fig. 5.

Female: length 2 mm.; head bright metallic green, sometimes appearing blue; antennæ dark brown, club of antennæ obliquely truncate from the tip nearly to its base, first funicular joint longer than pedicel and as thick as long, second to sixth funicular joints wider; face punctate; mesonotum between parapsidal grooves metallic green and shagreened, pronotum and scutel copper-bronze, the latter with a scaly sculpture; marginal vein slightly shorter than the stigmal; all coxæ dark, with metallic reflections, all tibiæ brownish over a little more than the basal half, their tips honey-yellow, all tarsi and their claws yellow; abdomen shining black, with metallic green and blue reflections.

Male: differs from the other sex chiefly as follows: pedicel slightly shorter than first funicular joint, other funicular joints subequal in length and thickness, club 2-jointed, the apex rounded; antennæ honey-yellow.

Bred from *Papilio glaucus.*

°**C. variegatum** Howard.

Female: length 0.93 mm.; mostly black, with brilliant metallic green luster; head punctate as in *gelechiæ;* scape mostly black, white at apex, pedicel black, first to fourth funicular joints white, fifth and sixth brown, club brown, flattened, rounded at tip, as long as the funicle, pedicel twice as long as the first funicular joint; thorax punctate as in *gelechiæ*; marginal vein wanting; all coxæ metallic, femora and tibiæ mostly dark brown, white at tips; all tarsi white.

Bred from a larva of the peach-twig moth (*Anarsia lineatella*).

Homalotylus Mayr.

°**H. terminalis** Say.

Length more than 1 mm.; body somewhat piceous; head yellowish, antennæ blackish, first joint nearly as long as the remaining joints combined, apical joint compressed, subtriangular and white; wings with a broad dusky band; intermediate tarsi white except at tip.

Parasitic on Coccinellids.

Aphycus Mayr.

°**A. pulchellus** Howard.

Female: length 1.35 mm.; mostly dark orange; ocelli nearly equidistant, the lateral ones well separated from the eye margin and nearer to the anterior ocellus than to each other; scape black, slightly orange above near the apex, pedicel mostly black, light at tip, funicle with its first joint brown, its second, third, and sometimes fourth, joints light brown, rest of funicle and club dirty yellow; metanotum pallid; wings hyaline, veins apparently colorless; all legs pallid; abdomen elliptical, pallid above.

Bred from a species of *Kermes* on *Quercus tinctoria.*

°**A. pulvinariæ** Howard.

Female: length 1 mm.; mostly dull yellow; scape mostly black, whitish at tip, with a leaf-like expansion beneath, pedicel black at base, yellowish white beyond, first three joints of funicle dusky, the other funicular joints yellowish white, club dark brown, lighter at apex, compressed, and as long as the four preceding joints combined; metanotum and dorsum of abdomen dusky, nearly black.

Bred from *Pulvinaria innumerabilis* and *Lecanium fletcheri.*

°**A. flavus** Howard.

Female: length 1.2 mm.; mostly bright orange-yellow; scape with a dusky patch above and somewhat broadened beneath on its basal half, club nearly as long as the funicle, compressed, and with its basal half dark brown, first and second funicular joints slightly dusky; wings clear, the veins yellowish.

This is an American parasite of the cosmopolitan *Lepidosaphes citricola.*

°**A. brunneus** Howard.

Female: length 1.06 mm.; body mostly yellow brown, yellow beneath; head shagreened, scape not broadened, pedicel brown, flagel yellowish, club brown; mesonotum between parapsidal grooves, scapulæ, and scutel densely punctate, the punctures of the two former transversely oval and those of the latter longitudinally oval, and converging toward the anterior angle, posterior border of scutel smooth, as is the metanotum; all coxæ brown, front legs with their tibiæ, femora, and tarsi yellowish white, with a dorsal brownish patch on the femora and tibiæ; mid legs with femora and tibiæ yellowish white except for a median brown annulus on each, their tarsi yellow; hind legs with their femora and tibiæ brown, but white at base of femora and at base and apex of tibiæ, their tarsi yellowish white; veins of the wings yellowish, dusky at origin of stigmal vein; ovipositor slightly exserted.

This is on record as an American parasite of the cosmopolitan *Diaspis rosæ*.

Blastothrix Mayr.

B. sericea Dalman.

Female: mostly green, smooth, dull and sericeous; head scarcely wider than the thorax, impunctate, antennæ distinctly separated at their insertion, which is below the front, scape compressed, black, flagel dusky at base, sixth and seventh joints pallid, apex obscure and compressed; thorax impunctate; legs mostly fuscous, their knees white, hind femora green, tarsi white, middle tibiæ bi-annulate with fuscous; wings hyaline, stigmal vein black: abdomen much shorter than thorax, obtuse, depressed above, base and apex green, shining, disk obscure aeneous.

Reared from *Phenacoccus acericola* parasitized by *Baccha fascipennis* in New Haven, August, 1905 (W. E. B.).

°**B. longipennis** Howard.

Female: length 1.75 mm.; head greenish above, bluish around the mouth; pedicel longer than first funicular joint, and together with the club and first to fourth joints of the funicle, black, fifth and sixth joints of funicle cream-white, club oval, somewhat compressed and rather longer than the two preceding joints combined; ocelli nearly equidistant; thorax above metallic green, tegulæ whitish, brownish at tip, pleuræ bright green, whitish at posterior border; anterior and posterior femora metallic green, white at tips, median femora light brown, white at tips and with a distinct dark patch beneath at the distal end, anterior and posterior tibiæ black with a greenish tinge, yellowish at distal end and white at the proximal extremity, median tibiæ yellowish with two black bands, but white at the proximal end, all tarsi yellowish white with the apical joint darker; veins of the wings dark brown, postmarginal longer than marginal and about as long as the stigmal; abdomen greenish above, bluish beneath.

Bred from *Lecanium fletcheri, L. robiniarum,* and other species of *Lecanium.*

Psilophrys Mayr.

°**P. pallipes** Ashmead.

Female: length 1.5 mm.; head smooth; thorax golden green, finely sculptured, with the disk of the scutel impressed anteriorly, metapleuræ distinctly blue; all legs uniformly pale testaceous in color, except a blotch on the posterior femora.

Bred from *Gelechia gallæsolidaginis.*

Litomastix Thomson.

°**L. truncatella** Dalman. U. S. Dept. Agric., Rept. Entomologist, 1883, Pl. xi, Fig. 6.

Mostly obscure greenish aeneous; head impunctate, front impressed, more shining, mouth yellowish, antennæ entirely black, flagel scarcely twice as long as the scape, apex of antennæ conicoacuminate; thorax above cyaneous, sericeous, scutel obscure greenish aeneous, thorax beneath obscure aeneous; legs black or obscure blackish aeneous, knees more or less testaceous, tarsi fuscous; wings hyaline, veins fuscous; abdomen mostly black, somewhat shining, and partly cyaneous.

Recorded as a parasite of the cabbage looper (*Autographa brassicæ*).

Leptomastix Foerster.

°**L. dactylopii** Howard.

Female: length 1.51 mm.; mostly honey-yellow, with a light reddish tinge on the mesonotum; occiput just behind the eyes, and the antennæ except for a slight yellow streak beneath, black; posterior margin of pronotum and dorsal surface of posterior femora more or less dusky; abdomen above dusky. Male: length 0.95 mm.; apparently darker than the female; the amount of black on dorsum of thorax variable; mesonotum yellow, scapulæ often very dark, scutel often with a median dark stripe, hind tibiæ and tarsi dark.

Bred from *Dactylopius destructor.*

Encyrtus Latreille.

°**E. inquisitor** Howard. U. S. Dept. Agric., Rept. Entomologist, 1880, Pl. 24, Fig. 1.

Female: length 1.5 mm.; head black with metallic bluish reflections, antennæ dark brown, head finely punctate; scape cylindrical, slightly widened toward tip, pedicel twice as long as thick, following joints not as long as thick, subequal, the eighth longest and thickest, club slightly compressed, longer than the six preceding joints combined, elongate-ovate, rounded at tip; mesonotum very dark, with coppery reflections, more coarsely punctate than the head and in addition shagreened, scutel black with purplish reflections; marginal vein almost obsolete, postmarginal vein a trifle shorter than the stigmal, at the junction of the stigmal and marginal veins a short hyaline interruption of the brown vein, proximal third of the anterior wings clear, the rest cloudy, hind wings clear; all coxæ, femora and tibiæ dark brown, tarsi honey-yellow, except apical joint, which is dark brown; abdomen smooth and shining, black with purplish reflections; ovipositor not exserted.

It is on record as an American parasite of the cosmopolitan common mealy-bug (*Pseudococcus citri*).

°**E. flavus** Howard, Rept. U. S. Com. Agric., 1880, Pl. 23, Figs. 7, 8.

Female: length 1.2 mm.; mostly ocher-yellow; scape yellowish, somewhat widened below, second to fifth joints brown above, yellowish beneath, sixth to eighth joints snowy white, club black; metanotum brownish; basal third of anterior wings clear, middle third dusky and separated by a clear transverse band from the distal third, which is also dusky, with two large wedge-shaped clear spots entering it, one from the anterior, the other from the posterior border of the wing; marginal vein very dark brown, the remaining veins lighter and more indistinct; all tarsi dusky at tips; abdomen with brown lateral spots on the first and second segments.

Male: length 0.85 mm.; mostly shining metallic green; scape light yellow, flagel dusky; mesonotum with a bronze or copper tinge; wings clear, veins dark brown; all legs light yellow, nearly white, tarsi dark at tips.

Listed as an American parasite of the cosmopolitan soft scale (*Coccus hesperidum*), also bred from *Eulecanium cerasifex* and *E. fletcheri*.

°**E. montinus** Packard. Scudder, Butterflies of New England, Vol. iii, Pl. 89, Fig. 4.

Female: length 2 mm.; mostly metallic green above, dull yellow at sides and beneath; head dull yellow, scape testaceous, pedicel and first four joints of funicle yellowish brown with dark hairs, fifth and sixth joints of funicle white with white hairs, club black with black hairs; pronotum, tegulæ and legs yellow, except hind femora, which are somewhat dusky above; front wings cloudy, with a single clear band extending across the wing from just beyond the stigma to the posterior border, curving slightly outward, an oblique hairless line also extending from the stigma across toward the base of the wing, the course of one of the spurious veins extending from the hairless line to the hyaline band; abdomen with its tip dull yellow.

°**E. bucculatricis** Howard. Lintner, First N. Y. Rept., 1882, Fig. 43.

Female: length 1.2 mm.; mostly black, with a slight luster; antennæ, except scape, yellowish brown with gray hairs; wings clear; mid legs with their trochanters and femoro-tibial articulations, a medial band and distal end on tibiæ, and the spurs of the latter, whitish, front and hind legs colored the same except the medial tibial band, all tarsi whitish, often with a yellowish tinge; abdomen smooth, ovipositor slightly exserted.

Bred from *Bucculatrix pomifoliella*.

°**E. anasæ** Ashmead.

Female: length 1.25 mm.; head blue-black, cheeks decidedly blue, antennæ mostly pale brown, scape yellowish at base; thorax blue-black, except the tip of the scutel, which is cupreous, and the pleuræ, which are decidedly blue; femora with a large bluish blotch in the middle, tarsi yellowish; abdomen cupreous.

Recorded as an American parasite of the cosmopolitan squash bug (*Anasa tristis*).

°**E. (Aphidencyrtus) aphidiphagus** Ashmead.

Female: body mostly blue-black; length 1.5 mm.; face and mouth-parts blue, ocellar region greenish, antennæ brown; hind margin of thorax metallic green; wings hyaline; legs mostly honey-yellow, all femora brown except at tips, tibiæ with a brown blotch near their base, terminal tarsal joints dusky; abdomen blue-black with bronzy reflections.

Bred from *Aphis brassicæ.*

°**E. clisiocampæ** Ashmead.

Female: length 0.8 mm.; mostly aeneous or dark bronzy green; antennæ 11-jointed, pale brown; mesopleuræ blue-black, tip of scutel violaceous; wings hyaline; coxæ, femora and tibiæ pale brown outwardly toward base, rest of legs light honey-yellow; abdomen aeneous, its membranous attachment to the thorax whitish or carneous. Male: legs mostly pale, their femora and tibiæ only slightly dusky; antennæ paler brown.

Bred from the eggs of *Malacosoma disstria.*

SIGNIPHORIDÆ.

Signiphora Ashmead.

°**S. flavopalliata** Ashmead. Orange Insects, 1880, Pl. ii, Figs. 2, 3, 6, 8, 12, 13.

Face round, ocelli equidistant or nearly so, antennæ inserted at the border of the clypeus, 6-jointed, scape reaching nearly to the top of the head when lying in apposition with the same, pedicel nearly as long as the scape, first three joints of the funicle very small, club apparently without sutures, mandibles bidentate, labial palpi rudimentary, maxillary palpi 3-jointed; anterior wings with the submarginal and marginal veins subequal in length, stigmal vein thinner than the marginal and curved, marginal and stigmal veins with some stiff bristles, disk of wing not ciliate, margin of wing ciliate from just beyond the stigmal vein around to a point opposite the stigmal vein, hind wings with the margin ciliate from beyond the marginal vein around nearly to the hind base; mid tibiæ with a number of stout bristles, apical spur as long as the first tarsal joint and with five or six bristles at regular intervals on the inner edge; front and hind legs unarmed; abdomen broadly sessile, rounded at tip, apical spiracles facing ventrally, ovipositor somewhat exserted. Male: penis cleft at tip.

Listed as an American parasite of the purple scale (*Lepidosaphes beckii*).

EUPELMIDÆ.

Key to Genera.

1. Eyes hairy, at least in the female 2
Eyes not hairy; posterior tibiæ and first tarsal joint not compressed 7

2. Females 3
Males 5

3. Hind tibiæ and first tarsal joint not compressed, or the former rarely only slightly so, front femora not much swollen, first tarsal joint of mid legs with strong spines or minute black teeth beneath; head as long as wide, or nearly so, face rarely deeply excavated, front ocellus never placed in a furrow, eyes oblong or ovate; axillæ widely separated, wings present, scutel without a tuft of hair; abdomen clavate or spatulate, not as long as thorax or shorter than head and thorax combined; depressed or flat above, dorsal flaps not incised, or the incision not very deep 4
Hind tibiæ and first tarsal joint compressed; axillæ meeting at base of scutel; antennæ 13-jointed ......**Metapelma** p. 508

4. Malar furrow distinct, no carina extending from lower part of each eye to base of each antenna; antennæ inserted on or somewhat below an imaginary straight line drawn tangent to base of eyes, rarely slighted above such a line **Anastatus** p. 508
Malar furrow indistinct or subobsolete, a distinct carina extending from lower part of each eye to base of each antenna; antennæ inserted just above clypeus .... **Arachnophaga** p. 509

5. Hind tibiæ and first tarsal joint not compressed, or former rarely only slightly so, front femora not much swollen; antennæ not branched 6
Hind tibiæ and first tarsal joint compressed; eyes hairy, flagel subclavate, obliquely truncate at tip..**Metapelma** p. 508

6. Antennæ inserted near middle of face above an imaginary straight line drawn tangent to base of eyes, flagel filiform, clothed with dense pubescence, joints of funicle thicker than long; mesonotal furrows distinct, entire; hind tibiæ not compressed; postmarginal vein twice or nearly twice as long as the stigmal ....**Anastatus** p. 508
Antennæ inserted just above clypeus or below an imaginary straight line drawn tangent to base of eyes; hind tibiæ somewhat compressed; pedicel obconic, smaller than first joint of funicle, joints of the latter, except sometimes the sixth and seventh, longer than thick; dorsal abdominal segments not incised medially at apex .... **Arachnophaga** p. 509

7. Front not indented below the antennal groove; middle or anterior ocellus not situate in antennal groove; scutel with a narrow base 8

Front indented below the antennal grooves; anterior or middle ocellus in antennal groove; middle tibiæ not very long **Eusandalum** p. 509

8. First tarsal joint of mid legs with strong spines beneath.... **Eupelmus** p. 510

First tarsal joint of mid legs without strong spines beneath **Ptinobius** p. 511

Metapelma Westwood.

°**M. spectabilis** Westwood.

Female: length 4.5 mm.; head green with cupreous reflections, antennæ black; thorax concolorous with the head; anterior and mid legs ferruginous with greenish reflections, mid tarsi fuscous, white at base, posterior legs fuscous, with their femora rufous at base, their tibiæ white at base; wings cloudy behind the middle, hardly infumated; abdomen black with chalybeous and purple reflections, ovipositor nearly half the length of the body.

Anastatus Motschulsky.

°**A. mirabilis Walsh.** *Eupelmus mirabilis.* Insects of Missouri, 6th Ann. Rept., 1874, Figs. 48, 49.

Female: length 3-3.5 mm.; head brilliant greenish coppery, with purple reflections, mouth and clypeus black, antennæ with the scape rufous and the other joints brown-black; prothorax rufous, mesonotum brilliant greenish coppery color, rest of thorax above black, with blue and green reflections, pleuræ sometimes rufo-piceous in part, sternum black, with metallic green reflections, membranous parts before and on each side of scutel rufous, a bright blue plate on each side of metathorax; legs rufous, hind coxæ dusky, especially above, mid and hind femora and tibiæ a little clouded externally with dusky, last tarsal joint of all legs dusky; front wings mostly dusky, with the apical sixth sometimes hyaline and the basal third and a transverse widely interrupted band a little beyond the middle whitish subhyaline, veins brown, hind wings hyaline, with their veins pale brown; abdomen mostly black, first segment with all but its basal fourth semitransparent white, sheaths of ovipositor white.

Male: smaller than female; partly brilliant metallic green, with faint blue and purple reflections; head bright green, antennæ black; thorax above either bright metallic or coppery green, with purple reflections, metathorax more bluish; all femora dusky, with a faint bluish reflection, trochanters rufous, coxæ steel-blue, front and middle tibiæ white, hind tibiæ dusky, all tarsi white, with the apical joint occasionally dusky; wings hyaline, stigmal vein faint; abdomen dark metallic blue.

Arachnophaga Ashmead.

°**A. picea** Riley.

Female: length 3.1 mm.; mostly aeneous black, with bronzy and metallic reflections; lower part of face and cheeks metallic green, anterior edge of clypeus and the mandibles ferruginous, palpi blackish, scape pale ferruginous; trochanters, anterior and mid femora, tibiæ and tarsi beneath, and posterior femora at tip, ferruginous, posterior femora and posterior coxæ with a metallic aeneous tinge, the latter with some silvery hairs, rest of legs blackish; wings hyaline, with a fuliginous blotch below the marginal vein; tegulæ dull fuscous, mesopleuræ blue-black; abdomen ovate, truncate behind, flat above, convex beneath, ovipositor nearly one-third the length of the body.

Male: body 2.1 mm. long; colored like the female except as follows: legs not ferruginous beneath, mid and posterior tarsi white, wings clear hyaline throughout, with the veins pallid.

Bred from the eggs of a spider (*Epeira globosa*).

Eusandalum Ratzeburg.

Ratzeburgia Foerster.

°**E. amphicerovorum** Ashmead. Kansas State Agricultural College, Experiment Station, Bull. 3, 1888, Fig. 3.

Male: length nearly 8 mm.; head purple and gold, antennæ black, with aeneous tinges; thorax mostly metallic brown, prothorax at sides and the metathorax blue; legs reddish yellow, with the hind coxæ purplish; abdomen metallic brown with a brassy spot at base.

Bred from *Amphicerus bicaudatus*.

Eupelmus Dalman.

°**E. allynii** French.

Female: length 2.5 mm.; mostly black with a greenish luster; antennæ uniformly black; wings hyaline; legs more or less yellow; femora of anterior and posterior legs, or all femora may be fuscous except at ends, tibiæ with basal half fuscous, terminal joint of tarsi fuscous; or all femora may be pale red and the tibiæ fuscous, or the mid tibiæ may be a little clouded at base. Male: femora yellow, front tibiæ yellow, mid and hind tibiæ fuscous, except at apices, which are yellow; otherwise colored as in the female.

This is on record as an important American parasite of the Hessian fly.

°**E. reduvii** Howard.

Female: length on an average 2.4 mm.; head dark metallic green, scape light yellow-brown, flagel black, with whitish hairs; mesonotum metallic green with coppery brown reflections, scutel brilliant light metallic green, sides of mesosternum yellowish; front legs yellowish brown, darker along the upper side, tarsal claws dark brown, mid legs colored like the front legs except that the serrated edge of first two tarsal joints is nearly black, hind legs all dark brown, lighter beneath; front wing with a dusky transverse band at the point where the subcostal vein reaches the costa, and another transverse band at the point where the stigma is given off, with its proximal border convex and well defined and its distal border gradually merging into the hyaline wing tip.

Male: average length 1.5 mm.; antennæ dark brown; head, prothorax, and mesonotum dark metallic green, rest of thorax coppery brown; abdomen dark brown, nearly black; front legs mostly light yellow, their tarsal claws brown; mid femora yellowish, with a brown stripe along the upper edge, their tibiæ yellow, with a brown annulation at distal end, tibial spines yellow, first and second tarsal joints yellow, the rest brown; hind femora brown, proximal half of their tibiæ yellow, the remainder dark brown; all coxæ yellow; wings clear, subcostal vein and stigma light brown.

Listed as an American parasite of the cosmopolitan squash bug (*Anasa tristis*).

°**E. limneriæ** Howard.

Female: length 3 mm.; mostly metallic green, including coxæ; antennæ black with metallic reflections; head about as wide as thorax; front femora honey-yellow, with a dark, somewhat metallic stripe on the outer side, mid femora honey-yellow, somewhat darker above, hind femora metallic, front and mid tibiæ honey-yellow, hind tibiæ with somewhat more than basal half fuscous, all tarsi yellowish, black at tip; abdomen about as long as the thorax.

This is a secondary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*) with (*Limnerium*) *Campoplex* (?) *validus* as host, also a tertiary parasite of the above moth with *Spilochalcis debilis* as host.

°**E. zeli** Ashmead.

Female: length 2.5 mm.; head and thorax mostly dark metallic green; antennæ pale brown; posterior raised lobe of mesonotum bluish, raised portion of mesonotum outside of parapsidal grooves, pleuræ, sternum, and legs including coxæ, mostly rufo-piceous, scutel and scapulæ bright golden, mid legs with their first to fourth tarsal joints provided with black teeth beneath, their spurs and tarsi yellowish, upper edge of posterior tibiæ blackish; wings hyaline, with two transverse brown bands; abdomen blue-black, exserted portion of ovipositor as long as the body.

Bred from the eggs of a bug, *Zelus longipes.*

°**E.** sp.

Bred from a Cecidomyid, *Diplosis resinicola,* on *Pinus rigida.*

°**E.** sp.

Host: *Aleiodes intermedius.*

Ptinobius Ashmead.

This genus is referred to the Cleonymidæ in Ashmead's classification.

°**P. magnificus** Ashmead. Kansas State Agricultural College, Experiment Station, Bull. 3, 1888, Fig. 2.

Female: length 6 mm.; purple and gold-green; antennæ mostly dark brown, with the scape yellowish brown; legs red, with the single tibial spur of mid pair white; wings hyaline, with the exception of two brown blotches, one beneath the commencement of the marginal vein, the other at the beginning of the postmarginal; abdomen with the first and second segments cupreous, the third golden green, the fourth purplish green, the fifth and following segments all dark blue; ovipositor not exserted beyond tip of abdomen.

Reared from the beetle *Amphicerus bicaudatus*.

CALLIMOMIDÆ.

Key to Genera.

1. Ovipositor exserted; antennæ with one ring-joint; flagel beyond ring-joint 8-jointed 2
Ovipositor not exserted .... **Ormyrus** p. 512
2. Stigmal vein knobless, or without a large knob; abdomen in male not narrowed 3
Stigmal vein with a very large knob; abdomen in male much narrowed at base .... **Megastigmus** p. 513
3. Posterior femora more or less dentate beneath 4
Posterior femora not at all dentate beneath 6
4. Posterior femora beneath with a single large tooth some distance from the knee, scutel with a transverse furrow behind the middle 5
Posterior femora finely dentate and in some cases with a single larger tooth in addition at some distance from the knee; posterior margin of first abdominal segment not incised .... **Oligosthenus** p. 514
5. Posterior margin of first abdominal segment not incised in either sex .... **Monodontomerus** p. 514
Posterior margin of first abdominal segment incised in the middle in the female, incised or not incised in the male .... **Diomorus** p. 513
6. Scutel with a distinct transverse furrow; first abdominal segment with its posterior margin entire or incised .... **Syntomaspis** p. 514
Scutel without a transverse furrow; first abdominal segment of male with its posterior margin incised.... **Callimome** p. 515

Ormyrus Westwood.

°**O. ventricosus** Ashmead.

Female: length 4 mm. or nearly so; mostly uniform aeneous green or dark greenish blue, including the scape and legs; anterior tarsal joints streaked above with brown, and the four terminal joints of middle legs brown, the basal joints yellowish, or all tarsal joints whitish and rest of legs greenish blue; abdomen bluish green above.

Bred from *Andricus ventricosus*.

°O. **vacciniicola** Ashmead.

Female: length 2.5-3 mm.; mostly blue-black, with a slight metallic luster; head finely transversely rugulose, antennæ mostly dark brown, scape rufous; thorax with wrinkled sculpture almost wanting; legs mostly pale brown with a reddish cast, posterior femora slightly infuscated above, all coxæ brown, except base of posterior pair; wings hyaline with brown veins; abdomen much compressed, brown with a metallic luster, a row of white hairs on each segment except the basal one, the apex produced into a slender point.

Bred from the gall-fly *Solenozopheria vaccinii*.

°O. sp.

Bred from *Diastrophus cuscutæformis*.

Megastigmus Dalman.

°M. **canadensis** Ashmead.

Female: length 2.5 mm.; mostly scaly punctate, and blue or bluish green in color; head broader than thorax, antennæ brown and pubescent; wings hyaline, stigmal vein knobbed and extending to the middle of the wing; legs mostly yellowish white, femora, except at tips, brown or greenish; abdomen dull metallic green.

Bred from an oak gall, *Biorhiza forticornis*.

°M. (?) **flavipes** Ashmead.

Male: length 1.5 mm.; mostly light blue, finely and confluently punctate; antennæ brownish black; wings hyaline, stigmal vein rather as in *Torymus*, knobbed, legs yellow; abdomen toward apex aeneous.

Reared from a cecidomyious larva on cedar.

Diomorus Walker.

°D. **zabriskei** Cresson.

Female: length 5 mm.; mostly bright metallic green, varied with shades of blue; antennæ mostly black, base of scape testaceous; thorax confluently punctate; wings hyaline, faintly dusky at tips; legs mostly green or blue, tibiæ fuscous or black, whitish at base, as is also the base of the tarsi, posterior femora with a tooth beneath near apex; abdomen smooth, polished, green to brilliant blue or purple in certain lights, ovipositor rather longer than the abdomen.

Bred from the nest of *Ceratina dupla.*

Oligosthenus Foerster.

°**O. stigma** Fabricius.

Female: length 4.5 mm.; mostly black, only slightly shining metallic, punctate and rugulose; mandibles, tibiæ and tarsi more or less yellowish; wings mostly hyaline, with a rounded cloud near the stigmal vein and in addition a weaker cloud in the middle of the wing, which latter is connected with the former by a weak shadow-like infuscation; abdomen compressed from side to side, ovipositor much longer than the abdomen, and yellowish. Male: much like the female.

Bred from the cosmopolitan rose gall-fly (*Rhodites rosæ*).

Monodontomerus Westwood.

M. aereus Walker.

Female: length 2.5-3.3 mm.; dark green, often with more or less coppery color; tibiæ reddish-brown, tarsi yellow; the row of pits at the margin of the scutellum complete, and as distinct medially as laterally; ovipositor about two-thirds as long as the abdomen; propodeum medially carinate, and basally on each side of the carina a quadrangular depression; back of these usually another smaller depression. Male: essentially as in the female.

A parasite of the brown-tail moth, introduced into Massachusetts from Europe in 1906, and now widely distributed. Recovered at Putnam, 1911, and at Hartford and Suffield, 1915.

Syntomaspis Foerster.*

S. lazulella Ashmead.

Female: length 2.6 mm.; mostly blue, with close punctures; antennæ black, face with slight metallic tingeings; pleuræ also with slight metallic tingeings, collar and mesonotum transversely scratched in addition to being punctate; anterior tibiæ and all tarsi, except apical joints, pale yellowish white, tibiæ usually with a blue streak above, mid and posterior tibiæ, except narrowly at base and apex, blue; wings hyaline, venation pale, the marginal vein about six times as long as the postmarginal, the latter twice as long as the stigmal, stigmal vein with a slight process; abdomen smooth and impunctate, except for a scaly punctuation at the sides.

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* See *Callimome* for species sometimes referred to this genus.

Reared from timothy grass infested by *Isosoma*, at the Experiment Station in New Haven. Bred from oak galls.

Callimome Spinola.

Torymus Dalman.

C. **bedeguaris** (Linnæus). *Torymus magnificus* Osten Sacken.

Female: length 4 mm. or a little longer. Male: length 3.5 mm. Thorax green or bluish green, collar with a purplish red spot near its junction with the head; abdomen blue or greenish at base, purplish and coppery toward tip, exserted portion of ovipositor 5-6 mm. long.

Bred from the root gall of the rose produced by *Rhodites radicum*, also from *R. bicolor*, etc.

*C. **brevicauda** Osten Sacken. *C. sackeni* Ashmead.

Female: length 3.5 mm. Male: length 3 mm. or slightly longer. Mostly bluish green; anterior coxæ yellow, with a green spot near the base, tarsi reddish yellow; abdomen with reddish or coppery reflections, exserted portion of ovipositor about 1.5 mm. long.

Reared from the galls of *Diastrophus nebulosus* on blackberry stems.

*C. **flavicoxa** Osten Sacken.

Female: length about 3 mm.; mostly coppery green; tarsi yellow, hind coxæ yellow, except at base, where they are bright green; anterior wings with a slight shade of yellow in the middle; anterior half of abdomen yellow, remainder of abdomen purplish coppery, exserted portion of ovipositor 2.5 mm. long.

Bred from the galls of *Rhodites radicum*.

°C. **advena** Osten Sacken *Syntomaspis*.

Female: length about 3 mm. Male: length about 2 mm. Mostly greenish blue; head punctate; thorax punctate; femora greenish or bluish, tibiæ of female yellow, posterior pair infuscated in the middle, all tibiæ in the male infuscated, tarsi mostly yellow, whitish at base, brown at tip; abdomen dark green and shining in the male, brilliant green and in part bluish in the female; exserted portion of ovipositor 2.3-3 mm. long.

Reared from the galls of *Diastrophus nebulosus* on blackberry stems.

°C. **harrisi** Fitch.

Female and male: length 2.5 mm.; mostly black; basal joint of antennæ black in the male, pale or whitish in the female; anterior wings usually with a smoky cloud or spot in the middle; legs mostly pale yellow, femora black, anterior and posterior tibiæ more or less dusky, claws black.

°C. **tubicola** Osten Sacken. *Syntomaspis.*

Female: length 2.2 mm. Male: length 1.7 mm. Mostly green with bluish reflections; thorax sericeous, with some scattered impressions that are indistinct; legs mostly black or greenish black, tarsi whitish, except tips, which are black; abdomen bright, shining green or bluish green, exserted portion of ovipositor 0.25 mm. long.

Bred from the galls of *Andricus tubicola.*

°C. **chrysochlora** Osten Sacken.

Female: length 3.5-4 mm. Male: length 2.5 mm. Mostly bright green; legs yellow; abdomen somewhat bluish near the base, exserted portion of ovipositor about 3 mm. long.

Bred from the galls of *Rhodites dichlocerus.*

°C. sp.

Bred from *Diastrophus cuscutæformis.*

°C. **pachypsyllæ** (Ashmead). *Monodontomerus pachypsyllæ* Ashmead.

Female: length 3-4 mm.; mostly golden green; finely confluently punctate and with a few scattered punctures; occiput, face and cheek more or less blue; scape and pedicel pale brownish yellow, flagel brown-black; collar above blue, metathorax and mesopleuræ steel-blue, scutel with a transverse furrow behind the middle; wings mostly hyaline, veins brown, stigma ovate, with a slight projection and a dusky shade surrounding it; legs, including all coxæ, pale testaceous, posterior femora armed beneath with a subapical tooth or process; abdominal flap straight, ovipositor

2.5-3 mm. long and brown-black. Male: length nearly 2 mm.; differs from the other sex in the almost entirely green head and in the presence of more of the metathoracic blue on the thorax.

Reared from the Psyllid *Pachypsylla venusta* Osten Sacken.

EURYTOMIDAE.

Key to Genera.

1. Metathorax above not longer than scutel 2

Metathorax above always longer than scutel 9

2. Marginal vein stigmated; hind tibiæ posteriorly provided with rigid bristles; antennæ at most 11-jointed, with one ring-joint, funicle 4-jointed and very similar in both sexes, without whorls of hair 3

Marginal vein not stigmated 4

3. Front wings without a dusky submarginal blotch or band.. **Eudecatoma** p. 519

Front wings with a dusky submarginal blotch or band .... **Decatoma** p. 518

4. Antennæ 13-jointed, with two or three ring-joints, and very similar in both sexes, funicle joints not excised or petiolate at apex and without whorls of hair 5

Antennæ 10- to 12-jointed, with only one ring-joint, and dissimilar in the sexes, male funicle joints excised or petiolate at apex, and with whorls of hair or with sparse hair; body not metallic; mesonotum umbilicately punctate; first joint of flagel shorter than scape; mesonotum with distinct, complete furrows; head sometimes with a deep antennal furrow, but anterior ocellus never placed therein 6

5. Pronotum quadrate, a little narrower than mesonotum ...... **Macrorileya** p. 519

Pronotum as wide as mesonotum, a little more than twice as wide as long ....**Rileya** p. 520

6. Marginal vein always distinctly longer than stigmal vein, and tibiæ with two apical spurs 7

Marginal vein not as long as or scarcely longer than stigmal vein 8

7. Females: postmarginal vein not much longer than stigmal; antennæ filiform or nearly so, at most subclavate, not much thickened toward apex; joints of funicle cylindrical; abdomen conic-ovate, subcompressed, fifth segment seen from the side shorter than wide ....**Eurytoma** p. 520

Males: postmarginal vein only a little longer than stigmal; funicle 5-jointed, joints at apex above excised, pedicellate, and with long whorls of hair; body of abdomen subovate, petiole usually longer than hind coxæ, fourth segment longest ....**Eurytoma** p. 520

8. Females: abdomen ovate, subcompressed, fourth and fifth segments subequal and a little longer than the others Bruchophagus p. 520

Males: funicle 4-jointed, joints briefly pedunculate at apex, with sparse, irregularly arranged hairs; body of abdomen oval, fourth segment largest ....Bruchophagus p. 520

9. Head not cornuted, eyes oval or ovate; marginal vein longer than stigmal, or rarely shorter, never stigmated; abdomen in female conic-ovate or conically pointed; antennæ dissimilar in the sexes, in female generally subclavate, in male with joints of funicle excised or constricted at apex and with whorls of long hairs 10

Head cornuted, much wider than thorax, eyes round; marginal vein four or more times longer than stigmal vein; antennæ 11-jointed ....Axima p. 524

10. Females; winged, marginal vein always longer than stigmal; metathorax sloping or rounded behind, not abruptly and squarely truncate behind, thorax more or less distinctly umbilicately punctate, punctate, or shagreened, opaque, never smooth and shining; antennæ usually 11-jointed, with one ring-joint, funicle 5-jointed 11

Males: marginal vein always longer than stigmal; metathorax not abruptly and squarely truncate behind, either sloping or rounded, thorax more or less distinctly umbilicately punctate or coarsely shagreened, opaque; head sculptured like thorax 12

11. Mesonotum umbilicately punctate, punctate or rugulose; abdomen conically pointed, segments subequal in length, fourth not or only slightly longer than third..Isosoma p. 522

Mesonotum with middle lobe nearly smooth, delicately punctate, usually with delicate transverse scratches anteriorly; abdomen conically pointed ....Evoxysoma p. 523

12. Mesonotum more or less distinctly umbilicately punctate, not finely transversely scratched anteriorly; joints of funicle more than twice longer than thick, constricted or briefly pedicellate at apex, and with indistinct whorls of hair.... Isosoma p. 522

Mesonotum not punctate as in *Isosoma*, middle lobe smoother, delicately punctate, usually with delicate transverse scratches anteriorly ....Evoxysoma p. 523

Decatoma Spinola.

°**D. varians** Walsh.

Female: length 2.5-4 mm. Male: length 2-3.5 mm. Pale ocher-yellow to honey-yellow to rufous; vertex with a black spot in the immediate vicinity of the ocelli and variable in extent;

antennæ from pale honey-yellow to rufous, rarely with brown-black above on the flagel; pronotum either spotless, or with a subquadrate black patch over it, or with only the lateral and basal portions black; mesonotum and metanotum black, generally with the sutures and the entire postscutellar triangles of the mesonotum yellow or rufous, pleuræ usually immaculate, rarely varied somewhat with black; legs usually with an abbreviated black mark on the femora, with occasionally all of the posterior femora black except extreme base and apex, tibiæ with a maculation analogous to that of the femora, all except hind coxæ spotless, the hind coxæ more or less maculated with black above; wings mostly hyaline, stigma and veins black; abdomen with the petiole in the male nearly two-thirds and in the female nearly one-fifth as long as the rest of the abdomen; the abdomen mostly black, with the petiole, two or three segments beyond, and the venter, often more or less piceous, rufous or honey-yellow; or the male abdomen may be mostly honey-yellow, with a black patch on posterior half of the dorsum.

Bred from galls of *Andricus podagræ*.

Eudecatoma Ashmead.

Spalangia.

°**E. quercilanæ** Fitch.

Length 2-2.5 mm.; mostly black, with the face, antennæ, and propleuræ whitish or greenish yellow; legs whitish or greenish yellow, upper side of hind femora and first joint of antennæ sometimes black, stigma black; abdomen beneath tawny red.

°**E. quercilanæ** var. **dorsalis** Fitch.

Thorax pale greenish yellow, with a black stripe along its middle; abdomen yellow, black above, and usually with black lateral bands.

Bred from *Philonyx erinacei* and *Ceroptres ficus*.

Macrorileya Ashmead.

°**M. œcanthi** Ashmead. *Rileya œcanthi.*

Female: length 6 mm.; mostly black; face with two furrows extending from base of antennæ to clypeus; parapsides distinct; wings hyaline, veins black, marginal vein longer than the subcostal, stigmal vein not quite one-third as long as the marginal, ending in a stigma and a claw-like projection, postmarginal vein extending to the apex of the wing; tips of femora, tibiæ and tarsi honey-yellow; abdomen subsessile, cylindrical, pointed at apex, and about three times as long as the rest of the body. Male: length 2.5 mm.; abdomen only one-third longer than rest of body, and less pointed than in the female.

Bred from eggs of tree crickets.

Rileya Ashmead.

Megastigma.

°**R. cecidomyiæ** Ashmead.

Female and male: length 1-2 mm.; mostly yellowish; head blue, face sometimes green; head of male may be all blue; propleuræ and tegulæ of male may be pale yellowish; thorax of male sometimes blue; wings hyaline; legs may be pale yellowish or almost white in the male, except a brown stripe along upper edge of posterior tibiæ and tarsi; abdomen occasionally with some greenish spots; venter of male sometimes all pale yellowish.

Bred from a Cecidomyid gall on *Baccharis halimifolia.*

Bruchophagus Ashmead.

B. funebris Howard. Clover-seed Chalcis. U. S. Dept. Agric., Bureau of Entomology, Circular No. 69, Figs. 5, 6, 7, 8.

Length about 1.7 mm.; mostly black, lower part of anterior legs and all tarsi light brown.

Egg whitish, polished and smooth. Larva whitish, completely filling the seed shell when mature. Pupa whitish, but changing to brown prior to the emergence of the imago.

This remarkable insect is one of the few injurious Chalcidoidea, in that it lays its eggs directly in the seeds of red and crimson clover and alfalfa, whereupon the larva hatches and then completely destroys all of the seed inside the shell.

New Haven, 20 July, 1904 (W. E. B.).

Eurytoma Illiger.

°**E. studiosa** Say.

Length less than 2.5 mm.; mostly black; antennæ moniliform; pronotum at least twice as broad as long, scutel obtusely rounded behind; wings hyaline; knees and tips of tibiæ honey-yellow, tarsi, especially the posterior pair, whitish; abdomen polished, impunctate, rather oval, orbicular when seen from the side, petiole shorter than the posterior coxæ and trochanters combined.

°**E. diastrophi** Walsh.

Female: length nearly 3-4 mm. Male: length about 3 mm. Antennæ in both sexes at most rufous only basally, occasionally entirely black; all coxæ black, as are the hind femora and hind tibiæ, except at base and tip; femora and tibiæ of mid legs and femora of front legs often more or less marked with black externally; abdomen entirely black.

Bred from the galls of *Diastrophus cuscutæformis.*

°**E. bolteni** Riley.

Female: length 4.5 mm. Male: length nearly 3 mm.; antennæ black; legs mostly fulvous, coxæ, femora, and more or less of tibiæ blackish brown; wings transparent, colorless, veins faint; abdomen black, smooth and highly polished.

Parasitic on larvæ of *Gelechia gallæsolidaginis.*

°**E. bicolor** Walsh.

Female: length 2-3 mm. Male: length nearly 3 mm. Mostly honey-yellow; head subopaque, confluently punctate; occiput above, and a spot enclosing ocelli and extending in one male in an angle nearly to the origin of the antennæ, but usually more or less widely confluent behind with the occipital spot, all black; scape honey-yellow except at tip, the second joint black, remaining joints brown-black; thorax with its sculpture similar to that of the head, but coarser; pronotum sometimes with only a black triangular area, usually entirely black; propleuræ usually partly black, with the black sometimes enclosing a pale dot; mesonotum and metanotum, except sometimes a small space above the wings, black; legs, including coxæ and trochanters, honey-yellow, sometimes immaculate, usually with the femora and tibiæ, especially of the female, more or less lightly tinged or marked with dusky above, each succeeding pair of legs more evidently so; wings hyaline, veins brownish white, usually merging into brown-black toward their tips; abdomen polished, black in the male, black, with the venter and more or less of lower part of dorsum honey-yellow, in the female.

Bred from galls on black oak.

°**E. quercipisi** Fitch.

Length 2.5-3 mm.; mostly black; anterior and middle femora black or brown in the middle, their tibiæ usually white, but often brown in the middle, all tarsi white.

°**E. lanulæ** Fitch.

Length 2 mm.; mostly black; only tarsi white, and these with their tips dusky; abdomen smooth and polished.

Bred from galls on willows and woolly galls on oak leaves.

°**E. querciglobuli** Fitch.

Length nearly 4 mm.; mostly black; basal joint of antennæ dull white; legs dull white, except the femora, which are pale dull yellow; abdomen tinged with pale dull yellow beneath.

°**E. auriceps** Walsh.

Female: length 2.5-3.5 mm. Male: length 2.5-3 mm.; hair of head and rest of body golden yellow; apical joint of antennæ sometimes rufous; hind coxæ occasionally tinged with black externally. Female with the hind coxæ and occasionally with a cloud in the middle of the anterior portion of hind femora, black, or the hind femora entirely black in the middle, mid and front coxæ generally more or less black, abdomen in female entirely black.

Bred from *Philonix erinacei.*

°**E. dorcaschemæ** Ashmead.

Female and male: size similar to that in *bolteni* and *studiosa;* male hardly separable from these two species; legs, except knees and tips of tibiæ, black.

Bred from *Dorcaschema alternatum.*

°**E.** sp.

Host: *Aulacidea solidaginis.*

Isosoma Walker.

To this genus belong the joint worms that are injurious to grain, but can be kept in check by seeing to it that all straw of any one season is entirely used up before the advent of another spring.

Key to Species.

Females.

1.	Mesonotum not smooth	2
	Mesonotum smooth and polished	4

2. **Mesonotum rugulose, shagreened or coriaceous, but not umbilicately punctate; thorax opaque or subopaque; abdomen longer than thorax 3**
Mesonotum more or less umbilicately punctate; pronotum with a rather distinct spot ....hageni
3. **Pronotum with a minute spot ....hordei**
Pronotum with a large spot; second abdominal segment shorter than fourth and fifth together ....tritici
4. **Winged ....grande form grande**
Wingless ....grande form minutum

The males must be determined by associating them with their mates.

°**I. (Philachyra) grande** Riley. U. S. Dept. Agric., Div. Entomology, Bull. 2, Technical Ser., 1896, Fig. 1.; U. S. Dept. Agric., Ann. Rept., 1881-2, Pl. xii, Fig. 3.

In this species there is an alternation of generations which gives it a unique position in the genus *Isosoma.* The winged summer generation is the form *grande,* and consists only of females; the wingless spring and winter generation, the form *minutum* Howard, consists of both sexes.

°**I. hageni** Howard.

°**I. tritici** Fitch. U. S. Dept. Agric., Div. Entomology, Bull. 2, Technical Ser., 1896, Fig. 7.

I. hordei Harris.

Reared from barley.

I. sp.

Reared from timothy grass at the Experiment Station in New Haven.

Evoxysoma Ashmead.

°**E. vitis** Saunders. U. S. Dept. Agric., Div. Entomology, Bull. 2, Technical Ser., 1896, Fig. 9.

Female: length 3 mm.; head, pronotum, and mesonotum umbilicately punctate; metanotum with a median longitudinal depression with convex sides, shagreened in the center; mesopleuræ below tegulæ shagreened, as are all the coxæ; antennæ submoniliform; abdomen as long as head and thorax combined; body mostly black; scape yellowish; all coxæ black except front pair, which are somewhat yellowish at tip, rest of front and mid legs honey-yellow, hind femora brown medially, honey-yellow at both ends, their tibiæ honey-yellow, slightly brownish in the middle; abdomen brownish only at base beneath. Male: petiole shagreened, longer than hind coxæ and as long as the succeeding abdominal segment; all legs, except mid and hind coxæ, honey-yellow.

Reared from grape seeds.

Axima Walker.

°**A. zabriskei** Howard. Insect Life, Vol. ii., p. 365, Figs. 68-70.

Female: length 6 mm.; mostly black, with indefinite ferruginous markings, especially on the thorax; antennæ mostly black, scape reddish at base; thorax on sides of pronotum and mesonotum more ferruginous than elsewhere; all coxæ black and punctate, all trochanters dark honey-yellow, all femora and tibiæ black in the middle and dark honey-yellow at the tips, all tarsi honey-yellow; wings hyaline, veins very dark brown; abdomen ferruginous only at base beneath; male very much like the female.

Bred from nests of *Ceratina dupla*, or the small carpenter bee.

PERILAMPIDÆ.

Key to Genera.

Scutel not produced into a spear-shaped process or spine; thorax umbilicately punctate; antennæ 13-jointed, flagel at most subclavate .... **Perilampus** p. 524

Scutel prolonged into a spear-shaped process or spine .... **Euperilampus** p. 525

Perilampus Latreille.

P. hyalinus Say.

Length 5 mm.; mostly cyaneous, legs mostly greenish golden, tarsi rufous, scutel emarginate-bidentate at apex.

Stafford, 24 August 1905, on goldenrod (W. E. B.).

Has been reared from *Campoplex* (*Ameloctonus*) *fugitivus*.

P. platygaster Say.

Length about 6 mm.; mostly blackish; face impunctate, polished, occiput somewhat transversely striated, a little punctate before the eyes; thorax brassy blackish, with a glabrous polished line on each side, scutel obtuse, rounded, slightly emarginate at tip; wings hyaline, veins brown; metanotum blackish, legs blackish with a tinge of green, tarsi yellowish.

New Haven.

Euperilampus Walker.

E. triangularis Say.

Length 5 mm.; mostly greenish and bluish; head green with a violaceous reflection, each side of face vertically striate, occiput transversely and longitudinally striate, violaceous; pronotum greenish, scutel not emarginate at tip, but pointed; wings dusky on apical half; tarsi yellowish; abdomen with the anterior half violaceous, the rest green with a violaceous reflection.

EUCHARIDÆ.

This is chiefly a tropical group, and, so far as our knowledge goes, confines itself to attacks on ants.

Key to Genera.

1. Females: antennæ 11-jointed 2
   Males: antennæ 10- to 13-jointed; scutellum not developed into processes 3
2. Joints of antennæ not serrate but cylindrical; scutellum simple, neither bidentate nor produced into long processes; thorax smooth, polished; petiole of abdomen abruptly enlarged at apex ....**Pseudometagea** p. 525
   Joints of antennæ serrate or subdentate; scutellum subconically elevated posteriorly; wings with a substigmal cloud or fascia ....**Chalcura** p. 526
3. Antennæ not branched, 10- to 11-jointed; flagellar joints cylindrical, not moniliform; petiole of abdomen abruptly enlarged at apex; thorax smooth ......**Pseudometagea** p. 525
   Antennæ with more than four branches; wings with a substigmal cloud or fascia ....**Chalcura** p. 526

Pseudometagea Ashmead.

°**P. schwarzi** Ashmead.

Female and male: length 1.5-2 mm.; mostly black; antennæ fuscous, pedicel yellowish beneath, head, except region around ocelli, smooth, polished and impunctate; parapsidal furrows and a central furrow indistinctly outlined by punctures; scutel conical-convex, with a longitudinal median furrow, the apex emarginate but not bidentate; pleuræ and metathorax rugose; male antennæ not subclavate as in the female, but filiform.

Chalcura Kirby.

°**C. gibbosa** Provancher.

Female: length 3 mm.; mostly black; antennæ with the first and second joints yellowish, vertex punctate, clypeus polished, face covered with scratches converging to a median ridge; thorax gibbose, punctate; wings hyaline, stigma and vein pale yellow; most of the legs yellowish, coxæ black; abdomen polished, the second segment enveloping the succeeding segments.

CHALCIDIDÆ.

Key to Genera.

1. Abdomen with a distinct petiole; ovipositor not exserted.... 2
Abdomen nearly sessile 3
2. Thorax immaculate, mid tibiæ not spurred at apex....... **Smicra** p. 526
Thorax maculated, mid tibiæ with spurs .....**Spilochalcis** p. 526
3. Antennæ inserted in middle of face 4
Antennæ inserted near mouth; head not cornuted; antennæ 12-jointed; metathorax without projections or teeth, scutel neither bidentate nor spined; hind femora finely denticulate beneath ....**Conura** p. 527
4. Abdomen conical ....**Phasgonophora** p. 527
Abdomen subglobose ....**Chalcis** p. 528

Smicra Spinola.

Key to Species.

Abdomen black; face entirely black; petiole as long as rest of abdomen and nearly as long as posterior coxæ; posterior femora black or brown, generally yellowish at base. Length nearly 4 mm. ....**microgaster**
Abdomen more or less red; posterior femora obscure reddish, varied with blackish, inner side mostly reddish. Length 5 mm. ....**rufofemorata**

°**S. microgaster** Say.

S. rufofemorata Cresson.

Branford, June 21, 1904 (H. L. V.).

Spilochalcis Thomson.

Key to Species.

1. Thorax with ground color black 2
Thorax with ground color not black 4

2. Markings of thorax small, but distinct; posterior femora with irregular whitish markings at apex, varied with pale brown; abdomen mostly black, with two or four white spots at base ....**torvina**

Markings of thorax large and yellow 3

3. Posterior femora yellow, irregularly black at base and along inferior edge; scutel with a longitudinally ovate, black, central spot ....**nortoni**

Posterior femora yellow, with a central black spot, confluent with lower edge, which is narrowly black to apex; scutel with a central black stripe or basal spot, lower edge armed with six mostly irregular teeth, protuberance beneath posterior wings black and yellow ......**bracata**

4. Thorax ferruginous; petiole of abdomen very long and slender; scutel ferruginous, with a central black stripe, lateral margin whitish ....**debilis**

Thorax lemon-yellow; posterior femora with numerous small teeth; wings hyaline or subhyaline; posterior coxæ lemon-yellow, with a broad black stripe above; petiole of abdomen not more than one-half length of posterior coxæ; abdominal segments narrowly banded with black ......**mariæ**

*S. **torvina** Cresson.

S. **nortoni** Cresson.

Bred from *Limacodes* larva.

°S. **bracata** Sanborn.

°S. **debilis** Say.

This is a secondary parasite of the white-marked tussock moth (*Hemerocampa leucostigma*), with the following hosts: *Casinaria* (*Amorphota*) *orgyiæ, Meteorus communis, M. hyphantriæ, Apanteles hyphantriæ* and *A. delicatus.*

S. **mariæ** Riley. Howard, Insect Book, Pl. ix, Fig. 6.

Has been bred from *Samia cecropia, Philosamia cynthia, Callosamia promethea,* and *Telea polyphemus.*

New Haven, 1910 (A. B. C.).

Conura Spinola.

°C. n. sp.

Reared from the lesser peach borer (*Synanthedon pictipes*).

Phasgonophora Westwood.

°P. **sulcata** Westwood.

Female: length about 9 mm.; mostly black; antennæ blackish brown, as are the veins of the wings; the latter tinted with brown;

abdomen and legs partly castaneous; head and thorax with adjoining umbilicate pits or punctures.

Chalcis Fabricius.

C. ovata Say.

Posterior femora mostly black, with a white or yellow spot at tips; dorsum of abdomen practically impunctate; tegulæ entirely white or yellow. Length 3.5-7 mm.

Primary parasite on the white-marked tussock moth (*Hemerocampa leucostigma*). Has also been bred from *Chlorippe clyton* and *Agraulis vanillæ*.

New Haven (A. E. V.).

LEUCOSPIDÆ.

But one genus of this family occurs in Connecticut. This may be known by the following description.

Leucospis Fabricius.

Frons anteriorly not cornuted, hind margin of head not curved inwardly; scutel never cordate; abdomen never pointed; front tibiæ as long as the femora, middle tibiæ without a tooth at apex, hind tibiæ with two spurs at apex; ovipositor curved up over the dorsum of the abdomen.

L. affinis Say.

Length 6-12 mm.; vertex more or less tinged with green or purple; prothorax with the lateral and posterior margins narrowly yellow, scutel yellow at apex; abdomen sessile or subsessile, elongate, ovipositor reaching to base of abdomen; rest of body mostly black, varied more or less with yellow, with the posterior coxæ from entirely black to entirely ferruginous.

Has been bred from nests of a leaf-cutter bee (*Megachile*).

Occurs throughout the state. New Haven, 21 June, 1902 (E. J. S. M.); Rockville, 23 August, 1905 (H. L. V.).

SERPHOIDEA.

PROCTOTRYPOIDEA.

By Charles Thomas Brues.

These are slender insects, mostly of small size, and nearly all are parasitic.

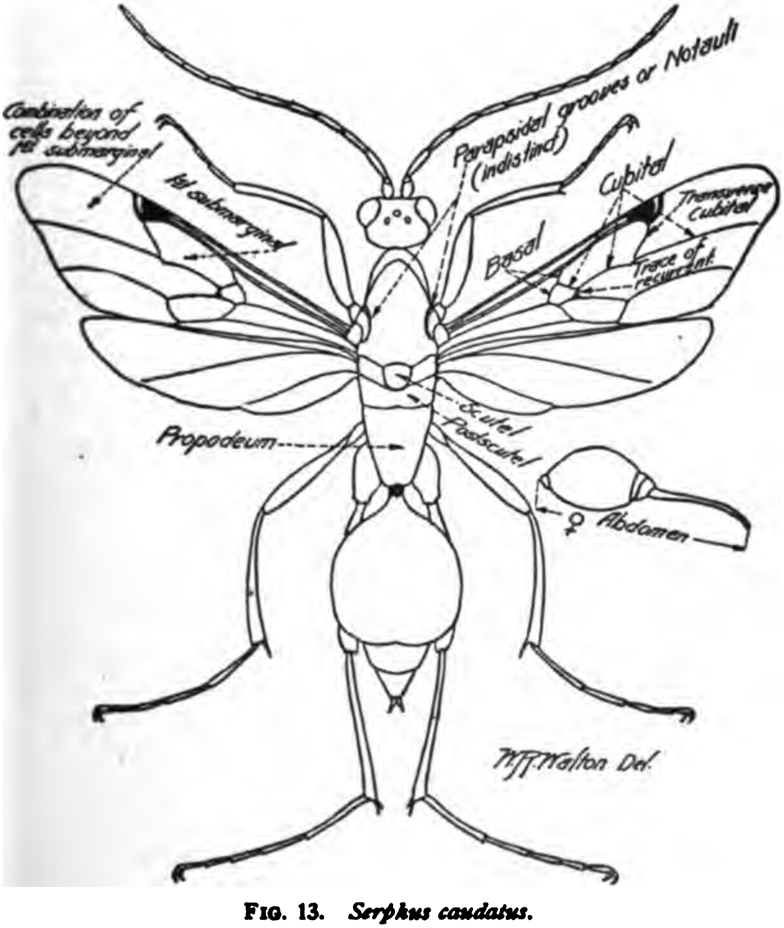

Fig. 13. *Serphus caudatus.*

NOMENCLATURE OF WING PARTS IN THE DRAWING OF *SERPHUS CAUDATUS*.

OLD SYSTEM	COMSTOCK-NEEDHAM SYSTEM
Veins	*Veins*
Basal	M and m-cu
Cubital	Media and at wing margin $R_{4+5} + M_1$
Transverse Cubital . . .	R_s and r-m
Recurrent	M_{3+4}
Cells	*Cells*
First submarginal . . .	1st $R_1 + R$
Fused cells beyond 1st submarginal	R_{3+4+5}
Marginal (reduced to a minute area beyond the stigma) .	2d R_1+R_2

Key to Families.

1. Trochanters with one joint; antennæ with fourteen joints; mandibles without teeth; stigma very narrow, long .... PELECINIDÆ p. 576

Trochanters with two joints, or stigma very short and broad 2

2. Antennæ inserted into middle of face 3

Antennæ inserted below middle of face at junction of clypeus with face 5

3. Wings present 4

Wings wanting 10

4. Front wings with a more or less distinct stigma 12

Front wings never with a more or less distinct stigma 11

5. Wings present 8

Wings wanting 6

6. Abdomen with sides acute or margined 7

Abdomen with sides rounded ....CERAPHRONIDÆ p. 557

7. Labial palpi with one joint ........PLATYGASTRIDÆ p. 531

Labial palpi with two or more joints ....SCELIONIDÆ p. 541

8. Abdomen with sides acute or margined 9

Abdomen with sides rounded; antennæ in female with ten or eleven joints, in male with eleven joints .... CERAPHRONIDÆ p. 557

9. Antennæ with ten, eight, or nine joints; no marginal or stigmal vein ....................PLATYGASTRIDÆ p. 531

Antennæ with twelve, eleven, or seven joints (rarely with ten joints, in which case either the wings bear a large stigma and the entire abdomen is longitudinally striated, or the marginal and stigmal veins are present) .... SCELIONIDÆ p. 541

10. Labial palpi with two joints ....DIAPRIIDÆ p. 561

Labial palpi with three joints ....BELYTIDÆ p. 568
11. Labial palpi with two joints, hind wings with no basal cell DIAPRIIDÆ p. 561
Labial palpi with three joints, hind wings always with a basal cell ....BELYTIDÆ p. 568
12. Mandibles without teeth, antennæ with thirteen joints ..... SERPHIDÆ p. 573
Mandibles with teeth, antennæ with fourteen or fifteen joints HELORIDÆ p. 576

PLATYGASTRIDÆ.

The species of this family are parasites of the larvæ of gall-gnats or midges and crane-flies, etc.

Key to Genera.

1. Submarginal vein in front wings ending in a stigma or knob; tarsi 5-jointed, antennæ 10-jointed, front wings without a basal nervure 2
Submarginal vein entirely absent or indicated only at base, never knobbed 3
2. Lateral ocelli nearer to eye margin than to front ocellus, basal segment of abdomen with a horn above .... **Inostemma** p. 532
Lateral ocelli nearer to front ocellus than to eye margin **Isostasius** p. 532
3. Scutellum lengthened, not semicircular; if shortened, compressed at sides and furnished with a spine 4
Scutellum not lengthened, semicircular, always unarmed.... 5
4. Abdomen much lengthened; club of female antennæ 5-jointed **Polymecus** p. 534
Abdomen not especially lengthened; club of female antennæ 4-jointed; scutellum with a thorn, or sometimes only a tubercle; lateral ocelli nearer to eye margin than to front ocellus; mesonotal furrows sometimes present .... **Amblyaspis** (includes **Leptacis** and **Synopeas**)*p. 532
5. Scutellum flat or subconvex 6
Scutellum convex or cushion-shaped 7
6. Mesonotum without furrows; antennæ 10-jointed, with a jointed club in female ....**Anopedius** p. 533
Mesonotum with more or less distinct furrows; antennæ 8-jointed in female, with an unjointed club ....**Amitus** p. 534
7. Scutellum bare 8
Scutellum with a tuft of hairs at tip; lateral ocelli not close to eye margin; club of antennæ 5-jointed ....**Trichasis** p. 534
8. Abdomen of usual length 9
Abdomen much lengthened ....**Polymecus** p. 534

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* These genera are all included together, as they do not appear to be separable by any trustworthy characters.

9. Thorax short, scutellum separated from mesonotum by a deep furrow 10
   Thorax more elongate, scutellum not separated by a deep furrow 11
10. Face with a distinct keel between antennæ .... **Eritrissomerus** p. 534
   Face not keeled .... **Polygnotus** p. 535
11. Lateral ocelli nearer to eye margin than to anterior ocellus **Platygaster** p. 540
   Lateral ocelli nearer to front ocellus than to eye margin **Isocybus** p. 541

Isostasius Foerster.

°**I. musculus** Ashmead.

Black, shining. Antennæ piceous or dark brown. Legs brown, coxæ black, trochanters, base and apex of femora, tibiæ, and all tarsi honey-yellow. Thorax with hardly a trace of furrows. Length 1.2 mm.

Inostemma Haliday.

°**I. horni** Ashmead.

Black, subopaque, closely finely punctulate; mesonotum shining. Antennæ black, the pedicel and first two funicular joints a little pale at tip. Parapsidal furrows complete. Legs black or piceous, tarsi yellowish, and tibiæ paler basally. Abdomen in female at base with a horn extending over the thorax to the vertex of the head. Male without horn. Length 1-1.4 mm.

A parasite of a Cecidomyid forming galls on the iron-weed (*Vernonia noveboracensis*).

Amblyaspis* Foerster.

Key to Species.

1. Scutellum produced into an acute spine ....**minutus**
   Scutellum triangular or with a tubercle at apex 2
2. Abdominal petiole, legs, and base of antennæ pale yellow **petiolatus**
   Antennæ dark brown 3
   Antennæ, except club of female, bright yellow ....**flavicornis**
3. Abdomen broadly oval, shorter than thorax ....**breviventris**
   Abdomen long-oval, longer than head and thorax together **antennariæ**

°**A. minutus** Ashmead.

Polished black, impunctate. Antennæ and legs yellow or reddish yellow. Scutellum acutely spined, yellow at tip, foveated on each side at base. Legs of male paler than those of female. Length 0.6-0.8 mm.

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* See note on p. 531.

Parasitic on a Cecidomyid infesting squashes.

°**A. petiolatus** Ashmead.

Shining black, impunctate. Antennæ except club, legs, and petiole, bright yellow. Flagellum of male brown. Thorax convex, without furrows. Scutellum triangular at apex, more or less pubescent, with a fovea on each side at base. Length 0.8 mm.

°**A. breviventris** Ashmead.

Shining black, impunctate. Antennæ and legs brown; the trochanters, bases of tibiæ, and tarsi yellowish. Thorax without furrows, scutellum foveated at base, pubescent at sides, and terminating in a tubercle or very short spine which is only twice as long as thick. Length 0.6-0.8 mm.

°**A. flavicornis** Ashmead.

Polished black; antennæ, except the club in the female, and legs bright yellow. Thorax without furrows, scutellum foveated at the base and ending in a minute tubercle. Abdomen oval, shorter than the thorax. Length 0.8-1.1 mm.

°**A. antennariæ** Ashmead.

Polished black, impunctate. Antennæ dark brown in female, pale brown in male. Legs reddish yellow, darker on femora and coxæ in female. Scutellum smooth, subconvex, not pubescent, the spine of tubercle wanting. Length 0.8-1.1 mm.

Anopedius Foerster.

A. error Fitch.

Polished black, impunctate. Antennæ black, the pedicel pale at tip. Thorax long-ovate, polished, the furrows very faint. Scutellum flattened or subconvex, separated from the mesonotum by a fine line. Legs brown-black; the trochanters, tip of anterior tibiæ, and all the tarsi paler. Abdomen oblong-ovate, slightly longer than the thorax in the female and a little shorter in the male. Length 1-1.2 mm.

Parasitic on the Cecidomyid *Contarinia tritici* and on the injurious clover-flower midge (*Dasyneura leguminicola*).

West Haven, 27 June, 1905 (H. L. V.).

Amitus Haldeman.

°**A. aleurodinis** Haldeman.

Polished black; legs most frequently brownish or pale rufous, the coxæ and femora sometimes dusky or blackish. Antennæ in female 8-jointed, brownish yellow, with an unjointed brown club; in male 10-jointed, with verticillate hairs. Length 0.75-1 mm.

A parasite of various species of *Aleyrodes*.

Trichasis Foerster.

°**T. rubicola** Ashmead.

Polished black, impunctate. Antennæ pale brown, the scape yellow. Thorax ovate, with distinct furrows. Legs yellowish; the coxæ black; the posterior femora and tibiæ dusky toward the tips. Abdomen longer than the head and thorax together, pointed at tip. Length 1.4-1.6 mm.

Parasitic on Cecidomyids making galls on *Vernonia noveboracensis* and on blackberry.

°**T. rufipes** Ashmead.

Black, shining, the thorax with a fine sparse pubescence. Antennæ brown-black, the scape rufous. Thorax elongate-ovate, with distinct furrows. Legs yellowish red, the coxæ black. Length 2-2.5 mm.

Bred from acorns which probably contained Cecidomyid larvæ.

Eritrissomerus Ashmead.

°**E. cecidomyiæ** Ashmead.

Black, subopaque, finely sculptured. Antennæ brown-black, except base and apex of scape. Thorax with two distinct furrows. Scutellum convex and margined at the sides, closely punctate. Legs blackish, lighter in the male, as are also the antennæ. Length 2.1 mm.

Parasitic in a Cecidomyid gall on hickory.

Polymecus Foerster.

Key to Species.

1. Thorax smooth, impunctate 2
   Thorax finely microscopically punctate or shagreened 3
2. Coxæ and legs yellow ....**auripes**
   Coxæ black, legs varied with dark ....**alnicola**

3. First flagellar joint longer than thick, legs piceous, varied with lighter .... **picipes**
First flagellar joint not longer than thick, legs brownish yellow .... **pallipes**

°P. **pallipes** Ashmead.

Black; finely granulately sculptured; subopaque. Female antennæ piceous; scape, pedicel, and three or four following joints yellow; in male entirely pale brown. Abdomen a little longer than the head and thorax together. Length 2-2.6 mm.

°P. **picipes** Ashmead.

Black, shining. Legs rufo-piceous or almost black, with the trochanters, tips of femora, and the tarsi paler. Antennæ brown-black. Scutellum very convex, subopaque, without any tubercle at tip. Length 1.8-2 mm.

°P. **auripes** Ashmead.

Black, shining, the head opaque, and closely microscopically punctulate. Antennæ and legs bright golden yellow. Thorax without furrows or with only traces posteriorly. Scutellum terminated by an awl-shaped spine. Length 1 mm.

°P. **alnicola** Ashmead.

Black, shining, the head and dorsum of the thorax microscopically punctate. Antennæ black, the tip of the pedicel honey-yellow. Mesonotal furrows complete. Scutellum highly convex, subopaque, the tubercle at tip subobsolete. Length 1.4-1.8 mm.

A parasite of *Cecidomyia serrulata* occurring on alder (*Alnus serrulata*).

Polygnotus Foerster.

Key to Species.

Females.

1. Mesonotal furrows distinctly indicated posteriorly 2
Mesonotal furrows entirely absent, or present only as the slightest trace posteriorly 12
2. Occiput strongly transversely striated or aciculated.......... 3
Occiput smooth or nearly so 7
3. Vertex simple, not impressed at middle 4
Vertex impressed at middle, subangulated just over eyes **striaticeps**
4. Coxæ black 5
Coxæ rufo-piceous or pale .... **viticola**
5. Head very wide, three and one-half or four times as wide as long 6

Head not so wide, two and one-half times as wide as long **hiemalis**

6. Tegulæ black, second flagellar joint longer than third **alnicola**
Tegulæ rufo-piceous, second and third flagellar joints nearly equal .... **tumidus**
7. Coxæ black 8
Coxæ rufo-piceous or pale 10
8. Metapleuræ bare, aciculated .... **cynipicola**
Metapleuræ covered with a sericeous pubescence 9
9. Tegulæ rufo-piceous .... **rubi**
Tegulæ black .... **asynaptæ**
10. Tegulæ rufo-piceous 11
Tegulæ black, second flagellar joint longer than the third **astericola**
11. No tuft of hair at the base of parapsides, second flagellar joint larger than third .... **actinomeridis**
Tuft of hair at base of parapsides, second and third flagellar joints about equal .... **vernoniæ**
12. Vertex transversely aciculate 13
Vertex smooth, not aciculate .... **pinicola**
13. Coxæ black, legs black or brown-black 14
Coxæ dark rufous or piceous, legs in part pale 15
14. Pedicel as long as two following joints united .... **salicicola**
Pedicel much longer than two following joints united.. **diplosidis**
15. Pedicel as long as first and second flagellar joints united ... **baccharicola**
Pedicel longer than first and second flagellar joints united **solidaginis**

Males.

1. Mesonotal furrows distinctly indicated posteriorly 2
Mesonotal furrows entirely absent, or present only as the slightest trace posteriorly 8
2. Coxæ brown or rufo-piceous 7
Coxæ black 3
3. Legs in part black 4
Legs rufo-piceous, anterior tibiæ and the tarsi honey-yellow 6
4. Legs black, only tarsi pale 5
Trochanters, anterior knees and tibiæ at tips, all tarsi, and base of mid and posterior tibiæ honey-yellow .... **hiemalis**
5. Pedicel as long as first and second flagellar joints together **striaticeps**
Pedicel as long as second flagellar joint .... **viticola**
6. Pedicel as long as first and second flagellar joints united **cynipicola**
Pedicel shorter than first and second flagellar joints united **alnicola**

7. Pedicel longer than second flagellar joint, last antennal joint twice as long as preceding .... **astericola**
Pedicel as long as first and second flagellar joints united, last joint less than twice length of preceding ...... **vernoniæ**
Pedicel as long as second flagellar joint, last joint one-third longer than preceding .... **euuræ**
8. Vertex transversely aciculated or striated posteriorly 9
Vertex smooth, or nearly so 13
9. Coxæ rufo-piceous 10
Coxæ black, legs black or brown-black .... **salicicola**
10. Pedicel about as long as second flagellar joint ..... **baccharicola**
Pedicel longer than second flagellar joint 11
11. Legs dark rufo-piceous, tarsi honey-yellow, femora and tibiæ dusky at middle 12
Legs rufous, tarsi pale, pedicel about as long as first two flagellar joints united .... **pinicola**
12. Second flagellar joint longer than third .... **solidaginis**
Third flagellar joint slightly longer than second ...... **diplosidis**
13. Coxæ black, pedicel as long as second flagellar joint.. **asynaptæ**
Coxæ pale or brown, pedicel as long as first two flagellar joints united .... **actinomeridis**

P. striaticeps Ashmead.

Black, shining. Head a little more than twice as wide as long. Face smooth, vertex and occiput strongly striate. Antennæ and legs black; anterior and mid tarsi pale. Tegulæ black. Length 0.6-1.2 mm.

West Haven, 27 June, 1905 (H. L. V.).

°**P. viticola** Ashmead.

Shining black. Head a little over three times as wide as long. Antennæ black; tegulæ rufo-piceous. Legs rufo-piceous or brownish; tarsi paler. Abdominal petiole striated, second segment with two long striolated foveolæ at base. Apical segments with rows of punctures at base. Length 1.2-1.4 mm.

Has been reared from Cecidomyid galls on grapevines.

°**P. hiemalis** Forbes.

Polished black. Head two and one-half times as wide as long. Vertex only faintly aciculated, face smooth. Antennæ brown-black. Tegulæ rufo-piceous. Legs dark brown or piceous; trochanters, tips of anterior femora and tibiæ, bases of mid and posterior tibiæ, and all tarsi lighter. Length 0.8-1.4 mm.

Parasitic on the Hessian fly (*Mayetiola destructor*).

°**P. alnicola** Ashmead.

Shining black. Head three and one-half times as wide as long. Antennæ dark brown, pedicel paler. Legs brown; the trochanters, tips of tibiæ, and all tarsi pale. Second abdominal segment striated at base. Length 1.2 mm.

Has been reared from Cecidomyid galls in the flower buds of the alder.

°**P. tumidus** Ashmead.

Polished black. Head four times as wide as long. Antennæ brown black. Legs brownish piceous; trochanters, tips of anterior tibiæ, and all tarsi paler. Second abdominal segment with striæ that extend to the middle. Length 1 mm.

A parasite of *Cecidomyia symmetrica,* an oak gall.

°**P. cynipicola** Ashmead.

Polished black. Head three and one-half times as wide as long, the vertex very faintly aciculated. Antennæ brown-black, the pedicel as long as the second flagellar joint. Tegulæ black; legs black or brown-black. The foveolæ at base of second abdominal segment striated. Length 0.6-0.8 mm.

°**P. rubi** Ashmead.

Black, polished. Head three times as wide as long, vertex not at all aciculated. Antennæ brown, scape and pedicel yellowish. Abdomen polished, the base of the second segment striate. Length 1 mm.

A parasite of *Cecidomyia farinosa,* occurring on blackberry.

°**P. asynaptæ** Ashmead.

Polished black. Head in female three and one-half times as wide as long, in male only three times. Vertex not or very faintly aciculated. Antennæ black. Legs black or piceous; tips of anterior tibiæ and anterior and mid tarsi brownish. Length 0.8-1.2 mm.

Has been bred from galls of *Asynapta* sp. occurring on willows.

°**P. astericola** Ashmead.

Polished black. Head three times as wide as long, vertex not or very faintly aciculated. Antennæ dark brown. Legs, including coxæ, rufo-piceous; trochanters, knees, tips of tibiæ, and all tarsi honey-yellow. Petiole, and foveolæ on second abdominal segment, striolated. Length 0.8-1 mm.

Has been reared from Cecidomyid galls on asters.

°P. **actinomeridis** Ashmead.

Polished black. Head two and one-half times as wide as long. Vertex very faintly aciculated. Antennæ dark brown, scape paler toward base. Legs dark rufous, the anterior tibiæ and all tarsi honey-yellow. Length 0.6-1.2 mm.

Has been reared from Cecidomyid galls on *Actinomeris squarrosa.*

°P. **vernoniæ** Ashmead.

Black, polished. Head nearly three times as wide as thick, the vertex not aciculated. Antennæ brown, or dark brown, pedicel in the female longer than the first two flagellar joints united. Legs brownish piceous; tips of mid and posterior tibiæ and all tarsi honey-yellow. Length 0.6-0.8 mm.

Has been reared from galls on *Vernonia noveboracensis.*

°P. **pinicola** Ashmead.

Shining black. Head two and one-half times as wide as long. Vertex not aciculated. Antennæ brown. Tegulæ piceous; legs, including coxæ, dark rufous; the tarsi and sometimes the tip of the anterior tibiæ honey-yellow or whitish. Length 0.8-1 mm.

A parasite of *Cecidomyia resinicola.*

°P. **baccharicola** Ashmead.

Shining black. Vertex posteriorly transversely aciculated. Face with some aciculations just above the antennæ. Antennæ piceous, the scape sometimes pale at base and apex, as is also the flagellum at base. Tegulæ piceous; legs, including coxæ, rufo-piceous; trochanters, base and tips of tibiæ, and the tarsi honey-yellow. Length 1-1.2 mm

Has been bred from a Cecidomyid gall of *Baccharis halimifolia.*

°P. **salicicola** Ashmead.

Polished black. Head three times as wide as long, vertex and occiput strongly transversely aciculated, face smooth. Antennæ black, pedicel pale at tip. Tegulæ black. Legs black, the tibiæ and tarsi piceous. Foveolæ at base of second segment faintly striolated. Length 0.8-1.4 mm.

Originally bred from a Cecidomyid gall on willow at Los Angeles, Cal., but occurs abundantly in the New England states.

°P. **diplosidis** Ashmead.

Polished black. Vertex less strongly aciculated than in the preceding. Antennæ brown-black. Tegulæ black; legs brown-black, the base of the tibiæ and tarsi paler.

Has been bred from a Cecidomyid living on pine.

°P. **solidaginis** Ashmead.

Polished black. Vertex strongly striated. Antennæ brown, the scape often black. Tegulæ piceous or black. Legs, including coxæ, variable, from pale rufous to rufo-piceous. Striæ on second abdominal segment extending to the middle. Length 1-1.6 mm.

Has been reared from galls on goldenrod.

°P. **euuræ** Ashmead.

Polished black. Head two and one-half times as wide as long. Antennæ brownish black. Tegulæ rufous. Legs, including coxæ, dark rufous. Pedicel as long as the second flagellar joint. Length 1.6 mm.

Has been reared from Cecidomyid inquilines in the gall of the sawfly *Euura nodus*.

Platygaster Latreille.

Key to Species.

1. Legs, except coxæ, yellow or golden yellow .... caryæ
Legs piceous or rufo-piceous 2
2. Head punctate, face more finely so .... herrickii
Face highly polished, with transverse striæ above antennæ aphidis

°P. **caryæ** Ashmead.

Shining black. Vertex rugose, the face finely, closely punctate. Antennæ yellow with fuscous club in female, light brown in male. Tegulæ piceous. Length 1.5-2 mm.

A parasite of a Cecidomyid forming galls on hickory trees.

°P. **herrickii** Packard.

Black, shining, finely punctate or microscopically shagreened. Antennæ black. Legs black or rufo-piceous; sometimes the bases of tibiæ and of tarsi yellowish.

An important parasite of the Hessian fly (*Mayetiola destructor*).

°**P. aphidis** Ashmead.

Shining black. Head posteriorly almost smooth, face polished. Antennæ and tegulæ black. Legs brown-black, the tarsi paler. Abdomen nearly twice as wide as the thorax. Length 1.6 mm.

Isocybus Foerster.

I. pallipes Say.

Black, very finely and closely punctulate. Legs honey-yellow with black coxæ. Pleural piece beneath the anterior wing not striated. Tegulæ rufo-piceous. Abdomen as long as the head and the thorax, widest toward the apex. Length 3.5 mm.

Milldale, 21 May, 1906 (B. H. W.).

°**I. canadensis** Provancher.

Black, finely rugosely punctulate. Differs from the preceding in having the pleural piece below the anterior wing striated. First flagellar joint twice as wide as long. Length 3-3.2 mm.

SCELIONIDÆ.

The members of this very extensive family are exclusively egg-parasites, attacking practically all orders of insects, and also spiders.

They may be recognized by the generally carinated abdomen, and the antennæ inserted near the base of the clypeus. The wings nearly always have a distinct venation. The antennæ of the females always have ten, eleven or twelve joints, except where the joints of the club are fused together.

Key to Genera.

1. Abdomen oval, acute on sides, but without distinct lateral carinæ 4
Abdomen distinctly carinated on sides 2
2. Abdomen long, fusiform or linear, segments nearly equal, postmarginal vein almost always present 19
Abdomen oval or elongate-oval, third segment much longer than any of the others 3
3. Marginal vein very short, not longer than stigmal vein; females usually apterous, with 7-jointed antennæ having an unjointed club 9
Marginal vein very long, usually five or six times the length

of the stigmal vein; females usually winged and with 12-jointed antennæ 16
4. Mesonotum without parapsidal furrows 5
Mesonotum with furrows, sometimes abbreviated in front.. 7
5. Lateral ocelli very close to or touching eye margin 6
Lateral ocelli far from eye margin, wings banded ....
Aradophagus p. 53
6. Head transverse, considerably wider than long ....
Telenomus p. 54
Head quadrate, abdomen more or less pointed Phanurus p. 54
7. Postscutellum armed with a spine ....Protrimorus p. 54
Postscutellum not armed 8
8. Mesonotum with three furrows, abbreviated anteriorly .....
Trissolcus p. 54
Mesonotum with two furrows, abbreviated anteriorly ......
Disolcus
9. Females ....
Males ....
10. Scutellum present ....
Scutellum wanting ....Baeus p. 5
11. First abdominal segment bearing a horn above ....
Ceratobaeus
First abdominal segment not horned ....
12. Mandibles bidentate ....Acolus p. 5
Mandibles tridentate ....Acoloides p. 5
13. Basal abdominal segment with a horn above ....Ceratobaeus
Basal segment of abdomen not armed ....
14. Basal nervure present ....
Basal nervure wanting ....Acoloides p. 5
15. Head subquadrate ....Baeus p. 5
Head transverse ....Acolus p. 5
16. Abdomen with first segment petioliform, longer than wide..
Abdomen with first segment as wide as or wider than long..
17. Posterior femora slender, tibial spurs weak ..Prosacantha p. 5
Posterior femora swollen, tibial spurs stout ......Teleas p. 5
18. Postscutellum with a small spine or tubercle..Hoplogryon p. 5
Postscutellum simple ....Paragryon p. 5
19. Postmarginal vein greatly lengthened, submarginal vein complete, not ending in a stigma ....
Postmarginal vein wanting or poorly developed, submarginal often abbreviated and stigmated ....
20. Basal nervure present, distinct ....
Basal nervure wanting ....
21. Females ....
Males ....
22. First abdominal segment with a horn or protuberance above
Basal segment unarmed ....

23. Marginal vein short, first abdominal segment narrow, petioliform .... **Caloteleia** p. 554
Marginal vein long, first segment of abdomen quadrate or nearly so .... **Baryconus** p. 554
24. Abdomen very long, second, third, and fourth segments nearly equal .... **Macroteleia** p. 554
Abdomen not so long, oblong-oval or fusiform.. **Cacellus** p. 555
25. Mesonotum with parapsidal furrows 26
Mesonotum without furrows 29
26. Postscutellum spined .... **Opisthacantha** p. 555
Postscutellum not spined 27
27. Marginal vein longer than stigmal vein 28
Marginal vein less than half length of stigmal vein .... **Caloteleia** p. 554
28. First joint of flagellum scarcely longer than third .... **Macroteleia** p. 554
First flagellar joint much longer than third... **Baryconus** p. 554
29. Marginal vein longer than stigmal vein .... **Baryconus** p. 554
Marginal vein shorter than stigmal vein 30
30. First joint of flagellum very long .... **Caloteleia** p. 554
First joint of flagellum shorter than second .... **Cacellus** p. 555
31. Females 32
Males 44
32. Mesonotum with parapsidal furrows 33
Mesonotum without furrows 36
33. Mesonotum with two furrows 34
Mesonotum with three furrows .... **Hoploteleia** p. 555
34. Metathorax unarmed 35
Metathorax with two teeth .... **Cacellus** p. 555
35. Mandibles tridentate .... **Macroteleia** p. 554
Mandibles bidentate .... **Caloteleia** p. 554
36. Postscutellum simple 37
Postscutellun armed with a spine .... **Opisthacantha** p. 555
37. Abdomen without a horn at base above 39
Abdomen with a horn at base above 38
38. Marginal vein short .... **Caloteleia** p. 554
Marginal vein long .... **Baryconus** p. 554
39. Abdomen broadly oval, sessile, antennal club 6-jointed .... **Hadronotus** p. 555
Abdomen long, fusiform, club of antennæ 6-jointed .... **Cacellus** p. 555
40. Submarginal vein ending in a stigma 41
Submarginal vein not ending in a stigma .... **Idris** p. 555
41. Head normal, without a frontal lamina or ledge 43
Head with a projecting frontal lamina or ledge 42
42. Scutellum quadrate, its posterior angles acute, postscutellum with a large erect spine .... **Acanthoscelio**

Scutellum and postscutellum normal ....**Sparasion** p. 55

43. Maxillary palpi long, 5-jointed, male antennæ 12-jointed .... **Scelionomorpha**

Maxillary palpi short, 3-jointed, male antennæ 10-jointed **Scelio** p. 55

44. Mesonotum with parapsidal furrows 45

Mesonotum without furrows 46

45. Mesonotum with two furrows ....**Macroteleia** p. 55

Mesonotum with three furrows ....**Hoploteleia** p. 55

46. Postscutellum simple, unarmed 47

Postscutellum with an erect spine ....**Opisthacantha** p. 55

47. Metathorax simple, unarmed ....**Hadronotus** p. 55

Metathorax bidentate at apex ....**Cacellus** p. 55

Protrimorus Kieffer.

°**P. americanus** Ashmead.

Smooth black, impunctate, sparsely pubescent. Head transverse, not wider than the thorax. Antennæ brownish, paler toward the base. Wings hyaline, the venation brown; marginal vein short, as long as the stigmal vein, which terminates in a small knob. Length 1.2 mm. (male).

Phanurus Thomson.

°**P. ovivorus** Ashmead.

Polished black; legs piceous, the knees and tarsi paler. Antennæ piceous, the flagellum nearly three times as long as the scape. Wings hyaline, the nervures yellow. Length 0.6 mm.

°**P. tabanivorus** Ashmead.

Polished black; legs fuscous; trochanters, knees, and tips of tibiæ and tarsi testaceous. Antennæ black, the flagellum not longer than the scape. Wings hyaline, the nervures brown. Length 1.2-1.3 mm.

Telenomus Haliday.

Key to Species.

Females.

1. Second abdominal segment not or very little longer than wide; antennæ 11-jointed ....

Second segment one-third longer than wide; antennæ 10-jointed ....

Second abdominal segment one and one-half times as long as wide at apex, head very wide; antennæ 11-jointed........ 13
2. Pedicel large, distinctly longer and thicker than first flagellar joint 3
Pedicel not longer than first flagellar joint ....**nigriscapus**
3. Antennal scape in part pale 10
Antennal scape entirely black 4
4. Second and third joints of flagellum longer than thick **persimilis**
Second and third flagellar joints rounded, not longer than thick 5
5. First abdominal segment striate 6
First abdominal segment not striate 8
6. Legs piceous or brown-black, trochanters, knees, tips of tibiæ, and tarsi pale or yellowish 7
Legs dark brown, tarsi whitish ....**heliothidis**
7. Marginal vein one-third length of stigmal ....**graptæ**
Marginal vein nearly one-half length of stigmal ..**spilosomatis**
8. Legs piceous or brown-black, trochanters, knees, tips of tibiæ, and tarsi pale or yellowish 9
Legs yellow or brownish yellow ....**bifidus**
9. Eyes distinctly pubescent ....**orgyiæ**
Eyes bare, or only faintly pubescent ....**ichthyuræ**
10. Scape in part piceous or black 11
Scape wholly pale 12
11. Coxæ black or piceous ....**rileyi**
Coxæ pale ....**geometræ**
12. Second abdominal segment smooth ....**arzamæ**
Second segment striate at the base ....**podisi**
13. Head two and one-half times as wide as thick ....**dimmocki**
Head three times as wide as thick ....**sphingis**

Males.

1. First and second flagellar joints equal or nearly so 2
Second and third joints equal, longer than first 5
Second and third joints equal, shorter than first 10
2. Coxæ black, legs partly piceous 11
Coxæ pale, or dusky only at base, legs lighter 3
3. Third flagellar joint half length of second ....**dimmocki**
Third flagellar joint only a little shorter than second 4
4. Legs yellow, first to third flagellar joints stout and elongate, joints beyond moniliform ....**podisi**
Legs brownish yellow, first to third flagellar joints not especially elongate, joints beyond transverse ....**bifidus**
5. Coxæ black 6
Coxæ pale 8
6. Pedicel shorter than first flagellar joint ....**graptæ**
Pedicel longer than first flagellar joint 7

7. Flagellar joints after third, moniliform ....spilosomatis
Flagellar joints after third, long-oval ....sphingis
8. Pedicel longer than first flagellar joint, legs whitish, femora and tibiæ tinged with brown, flagellar joints transverse geometræ
Pedicel shorter than first flagellar joint 9
9. Legs honey-yellow, flagellar joints longer than thick ....arzamæ
Legs reddish yellow, flagellar joints round, moniliform ... nigriscapus
10. First abdominal segment not striate ....chrysopæ
First abdominal segment striate ....heliothidis
11. Length 0.6 mm.; marginal vein one-third length of stigmal clisiocampæ
Length 1 mm.; marginal vein half length of stigmal.......fiskei

°T. dimmocki Ashmead.

Black, shining; mesonotum microscopically punctate, scutellum polished, impunctate. Female: antennæ black, the scape pale at base and the pedicel at tip; legs brownish yellow; coxæ black, femora, except tips, fuscous. Male with scape and legs yellow, coxæ dusky, flagellum light brown. Length 0.8-1.1 mm.

Is probably parasitic on the eggs of *Podisus spinosus*.

°T. nigriscapus Ashmead.

Black, shining, the thorax with a fine white pubescence; head very broad, the face polished. Female: scape of antennæ black, flagellum brown-black, and tip of pedicel yellow; legs black; trochanters, anterior tibiæ, and all knees and tarsi honey-yellow. Male with the legs and coxæ reddish yellow; antennæ pale brown, the scape paler. Length 0.7-0.9 mm.

°T. persimilis Ashmead.

Black, shining, the thorax distinctly punctulate, subopaque, pubescent. Head polished, alutaceous toward the vertex. Legs rufous, the coxæ black. Antennæ black, the pedicel yellow at tip. Length 1.5 mm.

°T. graptæ Howard.

Black, shining, the vertex subopaque. Female: legs piceous-brown, almost black; trochanters, knees, tips of tibiæ, and tarsi pale; antennæ entirely black. Male with the antennal scape black and the flagellum brown; legs a little paler than in the female. Length 0.6-1 mm.

Parasitic on various Lepidoptera, as follows: (*Grapta*) *Poly-*

gonia interrogationis, P. progne, Euvanessa antiopa, (*Chrysophanus*) *Heodes hypophlæas, Thymelicus cernes, Telea polyphemus.*

°**T. spilosomatis** Ashmead.

Polished black, impunctate, the thorax with a fine microscopic pubescence. Female: antennæ black, the flagellum dark brown; legs piceous brown; the trochanters, knees, apices of tibiæ, and the tarsi pale brownish yellow. Male with the antennæ pale brown, the legs pale brownish yellow with black coxæ. Length 0.6 mm.

Parasitic in the eggs of *Diacrisia virginica.*

°**T. heliothidis** Ashmead.

Smooth black, impunctate. Female: antennæ dark brown, the flagellum twice as long as the scape, the pedicel stout, as long as the first two flagellar joints together; legs dark brown, the tarsi pale. Male antennæ with the flagellum three times the length of the scape; pedicel and first flagellar joint equal; bases of tibiæ yellowish. Length 0.6 mm.

Parasitic in the eggs of the corn ear worm (*Heliothis obsoleta*).

°**T. orgyiæ** Fitch.

Black, shining; the thorax microscopically punctate, with a fine sericeous down; head a little more than three times as wide as thick; face highly polished; eyes pubescent; thorax very convex; legs black or piceous brown; trochanters, knees, tips of tibiæ and tarsi pale. Length 0.8 mm.

Parasitic in the eggs of the white-marked tussock or vaporer moth (*Hemerocampa leucostigma*).

°**T. ichthyuræ** Ashmead.

Black, shining, impunctate; the thorax covered with a fine microscopic pubescence. Head wider than the thorax, the face smooth and polished, female flagellum one and one-half times the length of the scape. Female: legs piceous brown; the coxæ black, trochanters, knees, base and apex of tibiæ, and tarsi honey-yellow. Male legs, except coxæ, pale brownish yellow. Length 0.6 mm.

Parasitic in the eggs of *Melalopha inclusa.*

°**T. bifidus** Riley.

Black, shining, the thorax microscopically punctulate and covered with a fine white pubescence. Head as broad as the thorax, highly polished. Antennal scape black, the flagellum brown-black, pedicel brownish yellow. Legs in the female, except coxæ, honey-yellow, femora darker; in the male wholly pale yellow. Male antennæ pale brownish. Length 0.6 mm.

Bred from the eggs of *Hyphantria textor.*

°**T. sphingis** Ashmead.

Black, shining, the thorax very faintly microscopically punctate, finely pubescent. Female: antennæ dark brown, scape sometimes black, usually pale beneath or at base and apex; legs pale brown or brownish yellow; coxæ black, and the femora and tibiæ more or less infuscated. Male antennæ and legs yellow, the coxæ black or dusky. Length 0.8-1 mm.

Found in the eggs of *Phlegethontius sextus.*

°**T. rileyi** Howard.

Black, shining, the thorax with fine microscopic punctation and down. Antennæ dark brown, the scape pale at extreme base. Pedicel a little longer than the first flagellar joint, second, third and fourth moniliform. Legs dark brown or piceous; trochanters, knees, and tarsi honey-yellow.

Parasitic in the eggs of *Chlorippe clyton.*

°**T. geometræ** Ashmead.

Black, shining, impunctate, head three times as wide as long, face convex, highly polished. Female: antennæ dark brown, pedicel twice as long as the first flagellar joint, which is only a little longer than thick; legs brown, posterior coxæ blackish; trochanters, knees, tips of tibiæ, and the tarsi pale. Male antennæ pale brown, the legs pale or yellowish, with darker femora and tibiæ. Length 0.45 mm.

Parasitic on the eggs of a Geometrid which infests the wild cherry.

°**T. arzamæ** Riley.

Black, shining, the head and thorax with a faint microscopic punctation and finely pubescent. Antennæ brown, flagellum darker above and beneath, pedicel scarcely longer than the first funicular joint. Legs rufous or reddish yellow; trochanters and tarsi paler; the femora and tibiæ sometimes darker. Length 0.8 mm.

Parasitic on the eggs of *Bellura gortynides.*

ᶜ**T. podisi** Ashmead.

Black, shining, the thorax very finely but distinctly punctate and with a white pubescence. Face smooth, vertex microscopically shagreened. Female: antennæ brown, the scape and pedicel yellow or brownish yellow, the pedicel distinctly longer than the first funicular joint. Legs, including coxæ, honey-yellow. Male antennæ with the pedicel half the length of the first flagellar joint. Length 1 mm.

Parasitic on the eggs of *Podisus spinosus*.

°**T. chrysopæ** Ashmead.

Black, shining, the thorax microscopically punctate, with a fine pubescence. Antennæ brown, the pedicel nearly as long as the first flagellar joint. Legs dark fuscous or brown; the coxæ black or blackish; trochanters, knees, and tarsi pale. Length 0.6-1 mm.

A common parasite on the eggs of various species of the Neuropterous genus *Chrysopa*.

°**T. clisiocampæ** Riley.

Black, shining, the thorax microscopically punctate. Female: antennæ black, the pedicel much longer than the first flagellar joint; legs piceous; trochanters, a small spot on knees, and the tarsi pale. In the male the pedicel is not so long as the first flagellar joint, and the legs are more yellow. Length 0.6 mm.

Parasitic on the American tent-caterpillar (*Malacosoma americana*).

°**T. fiskei** Brues.

Black, shining; legs, except coxæ, honey-yellow or brownish yellow, the femora piceous or fuscous. Wings hyaline, venation pale yellowish, marginal vein half the length of the stigmal vein. Antennæ of the female 10-jointed.

Parasitic on the eggs of the white-marked tussock moth (*Hemerocampa leucostigma*).

Trissolcus Ashmead.

Key to Species.

1. Legs, except coxæ, and antennal scape pale .... **brochymenæ**
   Legs, in part, and scape blackish 2
2. Scutellum rugoso-punctate, subopaque or punctate 3
   Scutellum smooth, impunctate 4
3. First flagellar joint shorter than pedicel .... **murgantiæ**
   First flagellar joint as long as or longer than pedicel... **euschisti**

4. First flagellar joint as long as or longer than pedicel podisi
First flagellar joint shorter than pedicel .... thyantæ

°**T. euschisti** Ashmead.

Shining black, very finely closely punctulate, thorax with a white pubescence. Face with a median furrow. Antennæ dark brown, the scape at base and tip, the pedicel, and one or two funicular joints more or less pale brown or yellowish. Legs black; trochanters and tips pale. Length 1.5 mm.

Parasitic on the eggs of *Euschistus servus.*

°**T. podisi** Ashmead.

Black, subopaque, thorax microscopically punctate. Head smooth, with a few punctures near the orbits. Antennæ entirely black. Legs black; trochanters, knees, tips of tibiæ, and tarsi pale or yellowish. Length 1-1.2 mm.

Parasitic on the eggs of *Podisus spinosus.*

°**T. thyantæ** Ashmead.

Black, subopaque, closely microscopically punctulate. Antennæ black. Legs black; tips of all femora, as well as the tibiæ and tarsi, honey-yellow. Marginal vein about one-third the length of the stigmal vein. Length 0.8-1 mm.

Parasitic on the eggs of *Thyanta custator.*

°**T. murgantiæ** Ashmead.

Black, rugose, the abdomen smooth and polished. Female antennæ entirely black, those of the male with yellowish scape. Legs black; the trochanters, knees, and distal ends of the tibiæ dark or honey-yellow. Length 0.14-1 mm.

Parasitic on the eggs of the harlequin cabbage-bug (*Murgantia histrionica*).

°**T. brochymenæ** Ashmead.

Shining black, the thorax scarcely punctulate. Antennæ black, scape, pedicel and first flagellar joint brownish yellow. Legs honey-yellow, with black coxæ. Length 0.8-0.9 mm.

Parasitic on *Brochymena arborea.*

Aradophagus Ashmead.

°**A. fasciatus** Ashmead.

Smooth, polished, honey-yellow. Scape, pedicel, and basal half of first flagellar joint pale or whitish, rest of antennæ brown-black. Wings fuscous, the base and a median band hyaline. Length 1.5 mm.

This species is thought to be parasitic on the eggs of certain Aradidæ.

Acoloides Howard.

°**A. saitidis** Howard.

Entirely black. Legs and antennæ honey-yellow, coxæ black, scape (in female) brownish. Male antennæ uniformly honey-yellow. Body opaque, closely minutely punctulate. Wings well developed. Length 1.4 mm.

Parasitic on the eggs of the spiders, *Saitis pulex* and *Phidippus morsitans*.

°**A. emertonii** Howard.

Black, shining, but closely microscopically punctulate. Antennæ brown-black, scape pale at extreme base. Legs, including coxæ, brownish yellow. Wings well developed. Length 1.4 mm.

Acolus Foerster.

°**A. zabriskei** Ashmead.

Black, polished, finely sericeous. Mandibles reddish, scape honey-yellow, flagellum pale brown. Legs, including coxæ, reddish yellow. Length 1 mm.

Parasitic on spiders' eggs.

Bæus Haliday.

°**B. niger** Ashmead.

Black, shining, with a fine sericeous pubescence. Antennæ with the scape and flagellum pale rufous or brownish yellow, the club large and black. Length 0.7 mm.

°**B. americanus** Howard. Howard, Insect Book, p. 51, Fig. 26.

Dark honey-yellow, the antennæ and legs pale yellowish. Abdomen fuscous. Length 0.8 mm.

Bred from the eggs of an Epeirid spider.

Prosacantha Nees.

Key to Species.

1. Antennæ in part rufous or pale 2

Antennæ entirely black, thorax smooth and shining .... **pennsylvanica**
2. Mesonotum smooth and shining or finely punctulate **caraborum**
Mesonotum rugose or coarsely sculptured 3
3. Coxæ pale 4
Coxæ black .... **punctiventris**
4. Abdomen longitudinally striated throughout .... **striativentris**
Abdomen striated at base but smooth or punctate apically **marylandica**

°**P. caraborum** Riley.

Black, shining, the thorax finely rugulose, the scutellum almost smooth. Antennæ dark brown or black, the scape a little pale at the extreme base. Legs reddish yellow; the coxæ basally and the mid and posterior tibiæ and tarsi fuscous. First three abdominal segments striated. Length 1.6-1.8 mm.

Parasitic on the eggs of *Chlænius impunctifrons,* a Carabid beetle.

°**P. punctiventris** Ashmead.

Black, the thorax and scutellum longitudinally rugulose, subopaque. Antennæ black, the scape basally rufous. Wings subfuscous. Abdomen punctate, striate on the three basal segments. Length 2.5 mm.

P. marylandica Ashmead.

Black, thorax and scutellum rugoso-punctate. Antennæ black, the scape basally and the pedicel at apex yellowish. Legs, including coxæ, brownish yellow. Abdomen striated, the fourth and following segments punctate. Length 2 mm.

Salisbury, 30 August, 1904 (W. E. B.).

°**P. pennsylvanica** Ashmead.

Black, shining, sparsely pubescent, the punctation of the thorax very fine and faint. Antennæ black. Legs piceous; trochanters, knees, tips of tibiæ, and base of tarsi yellowish. Length 1 mm.

°**P. striativentris** Ashmead.

Black, the head and abdomen shining, the thorax opaque, closely punctulate. Abdomen longitudinally striated for its entire length. Legs brownish yellow, the coxæ dusky basally. Length 1.5 mm. (male).

Teleas Latreille.

T. coxalis Ashmead.

Black, shining, pubescent. Antennæ black, the scape pale at base. Thorax and scutellum coarsely rugose, vertex not striated but slightly sculptured. Three basal abdominal segments striated, the fourth and following closely punctate at base. Length 2 mm.

New Haven, 1 September, 1904 (H. L. V.).

Hoplogryon Ashmead.

°**H. minutissimus** Ashmead.

Black, subopaque, closely microscopically punctulate. Legs brown or fuscous; the trochanters, knees, tips of tibiæ, and tarsi pale; coxæ black. Wings extending just beyond the tip of the abdomen, hyaline. Third abdominal segment smooth. Length 0.75 mm.

°**H. claripennis** Ashmead.

Black, shining, thorax faintly punctulate, scutellum smooth and polished. Coxæ and legs yellow. Wings hyaline, third abdominal segment smooth. Length 1.2 mm.

Paragryon Kieffer.

Key to Species.

1. With wings .... **fumipennis**
   Wingless 2
2. Coxæ black 3
   Coxæ pale .... **flavipes**
3. Abdomen shining, metathoracic angles more or less obtuse **borealis**
   Abdomen subopaque, metathoracic angles acute .... **columbianus**

°**P. fumipennis** Ashmead.

Black, shining, minutely punctulate. Mandibles and legs yellow. Antennæ black, the scape yellowish toward the base. Metathoracic angles obtuse. Mesonotum with traces of parapsidal furrows posteriorly. Wings smoky hyaline, paler at base. Length 1.4 mm.

°**P. borealis** Ashmead.

Apterous, black, subopaque, closely microscopically punctate, and with a fine sericeous pubescence. Metathorax with the angles subacute. Antennæ black or piceous. Legs pale rufous or brownish yellow with black coxæ. Length 1 mm.

°**P. columbianus** Ashmead.

Black, opaque, closely minutely punctulate. Antennæ piceous, scape pale rufous. Legs, except coxæ, brownish yellow. Angles of metathorax acute. First and second abdominal segments with coarse striæ. Length 1.4 mm.

°**P. flavipes** Ashmead.

Black, shining, finely punctulate. Legs, including coxæ, pale yellow. Antennæ piceous, scape basally below pale. Metathoracic angles obtuse. Second abdominal segment striated only at the suture. Length 0.6 mm.

Caloteleia Westwood.

°**C. parvipennis** Melander and Brues.

Honey-yellow; the head, flagellum, tegulæ, abdominal horn and tip of abdomen black. Wings reaching only to the middle of the abdomen. Wings yellowish fuscous. Length 1 mm.

C. marlattii Ashmead.

Brownish yellow, the head black or fuscous. Abdomen more or less blackened apically. Wings hyaline, reaching nearly to the tip of the abdomen. Length 2.5-3.2 mm.

West Haven, 27 June, 1905 (H. L. V.).

Baryconus Foerster.

°**B. œcanthi** Riley.

Black, closely punctate, subopaque and sparsely covered with a sericeous down. Antennæ black; legs black, the bases of the tibiæ and tarsi brownish. Abdomen rugulose, tip of horn of female polished. Length 2.5-3 mm.

An egg parasite of the tree cricket (*Œcanthus niveus*).

Macroteleia Westwood.

°**M. floridana** Ashmead.

Slender, very long, black, rugoso-punctate and sparsely pubescent. Antennæ dark brown, the scape pale. Legs brownish yellow, coxæ of the female black. Abdomen with lineated sculpture basally, the apical segments almost smooth. Length 3.5-4 mm.

°**M. virginiensis** Ashmead.

Black, shining, with a thimble-like punctation. Antennæ brown-black, the scape brownish yellow. Legs, including coxæ, reddish yellow. Abdomen with large punctures. Length 4 mm.

Opisthacantha Ashmead.

°**O. mellipes** Ashmead.

Black, subopaque, almost invisibly punctate. Antennæ piceous, the scape yellow. Legs pale honey-yellow. Postscutellum armed with an acute spine. First three abdominal segments striated. Length 1.4 mm.

Cacellus Ashmead.

°**C. œcanthi** Riley.

Black, subopaque, closely punctate and covered with a fine sericeous down. Female: antennæ with the base and apex of scape and two terminal joints pale. Legs pale rufous. Male antennæ brownish yellow. Length 2-2.2 mm.

Parasite on the eggs of species of tree-crickets (*Œcanthus*).

Hoploteleia Ashmead.

°**H. floridana** Ashmead.

Brown-black, closely rugoso-punctate, the middle of the mesonotum smoother. Antennæ of female black, the scape rufous; of male brown, with yellowish scape. Abdomen longitudinally rugulose. Length 3.5-4 mm.

Hadronotus Foerster.

°**H. anasæ** Ashmead.

Black, coarsely irregularly rugoso-punctate, with a sparse whitish pubescence. Abdomen more evenly and less coarsely sculptured, somewhat lineated. Antennæ of female brown, scape, pedicel, and sometimes the base of the flagellum yellow. Legs brownish yellow, the coxæ sometimes dusky or even black. Length 1.2 mm.

A common parasite of the eggs of the common squash-bug (*Anasa tristis*).

Idris Foerster.

***I. nigricornis** Brues.

Polished black, legs and antennal scape basally rufous. Antennæ black, except the base of the scape, which is rufous. Legs dark brown, rufous, or yellow. First two abdominal segments striated. Length 2.5 mm. (male).

Type locality: Colebrook, 19 August, 1901 (W. M. W.).

Bred from a mixed nest of the ants, *Myrmica* and *Leptothorax*.

Sparaison Latreille.

°**S. famelicum** Say.

Elongate, black, subopaque, punctate. Antennæ fuscous; legs honey-yellow, with black coxæ. Parapsidal furrows distinct, the scapulæ with a longitudinal grooved line. Wings hyaline. Length 4.5 mm.

°**S. nigrum** Ashmead.

Black, shining, very pilose. Frontal ledge in male only a transverse carina, in the female broader and slightly oblique. Antennæ black. Legs black, tibiæ and tarsi more or less yellow. Abdomen of male opaque, rugose; of female punctate, striate and shining. Length 3-3.5 mm.

Scelio Latreille.

Key to Species.

1. Mesonotum with no indications of parapsidal furrows 2
   Parapsidal furrows faint but distinct 3
2. Coxæ pale brownish yellow, wings pure hyaline ....**hyalinipennis**
   Coxæ black, wings subfuscous in female, subhyaline in male **ovivorus**
3. Stigmal vein present, short ....**luggeri**
   Stigmal vein entirely absent ....**calopteni**

S. hyalinipennis Ashmead.

Black, coarsely rugoso-punctate. Scape, pedicel beneath in female, and legs except coxæ, brownish yellow or reddish. Wings clear hyaline, with only a trace of the submarginal vein. Length 4-4.5 mm.

West Haven, 27 June, 1905 (H. L. V.).

S. ovivorus Riley.

Black, very coarsely rugoso-punctate. Antennæ brown-black, the scape and pedicel pale rufous or brownish yellow. Legs, including coxæ, pale yellowish. Stigmal vein present. Length 3.6-4.2 mm.

Has been bred from the eggs of the Carolina locust (*Dissosteira carolina*).

Waterbury, 10 July, 1879 (W. H. P.).

S. calopteni Riley.

Black, rugose, the mesonotum with faint but distinct furrows. Antennæ brown-black, the scape and pedicel yellow. Tegulæ pale rufous. Legs, including coxæ, pale brownish yellow. Length 3-3.4 mm.

Parasitic on the eggs of (*Caloptenus*) *Melanoplus atlanis.*

S. luggeri Riley.

Black, rugose, differs from the preceding only in the presence of a short stigmal vein and the entirely brown-black antennæ.

Parasitic on the eggs of *Caloptenus* sp.

CERAPHRONIDÆ.

Key to Genera.

1.	Marginal vein stigmated, antennæ 11-jointed in both sexes	2
	Marginal vein not stigmated, male antennæ with one more joint than in female	9
2.	Males	6
	Females	3
3.	Metathorax not spined at base	4
	Metathorax with a forked spine at base	**Megaspilus** p. 558
4.	Thorax much narrowed; completely apterous	**Eumegaspilus** p. 559
	Thorax as usual	5
5.	Mesonotum narrowed anteriorly, eyes pubescent	**Conostigmus** p. 558
	Mesonotum not narrowed in front, eyes usually bare	**Lygocerus** p. 558
6.	Metathorax with a forked spine at base	**Megaspilus** p. 558
	Metathorax not thus armed	7
7.	Apterous	**Eumegaspilus** p. 559
	Fully winged	8
8.	Antennæ dentate or ramose	**Lygocerus** p. 558
	Antennæ filiform, not dentate	**Conostigmus** p. 558
9.	Males	11
	Females	10
10.	Scutellum flat or subconvex, with a frenum	**Ceraphron** p. 559
	Scutellum convex, without a frenum	**Aphanogmus** p. 560
11.	Scutellum depressed or flat, with a frenum; antennæ simple, not serrate	**Ceraphron** p. 559
	Scutellum convex, acuminate, without a frenum; antennæ serrate	**Aphanogmus** p. 560

Megaspilus Westwood.

Habropelte Thomson.

°**M. armatus** Say.

Black, more or less pilose. Wings fusco-hyaline, darker beneath the stigma. First flagellar joint of the female three times as long as the pedicel, in the male not longer than the scape. Length 3.4-4 mm.

°**M. fuscipennis** Ashmead.

Differs from the preceding by the shorter first flagellar joint of the female, which is less than three times the length of the pedicel. In the male it is not longer than the scape.

Lygocerus Foerster.

°**L. stigmatus** Say.

Black, pubescent, finely punctulate, subopaque. Legs piceous-black, varied with honey-yellow. Male with the first five flagellar joints dentate, the first twice as long as thick. Length 1.4 mm.

Parasitic on aphids on poplar and raspberry.

°**L. niger** Howard.

Differs from the preceding in having the first to seventh flagellar joints of the male dentate, the first being two and one-half times as long as wide. Length 1.6 mm.

Parasitic on the wheat aphis (*Siphonophora avenæ*).

Conostigmus Dahlbom.

Megaspilus Westwood.

Key to Species.

Females.

1. Face smooth, polished, and impunctate 2
   Face finely punctulate or shagreened 3
2. Apex of abdomen compressed so that it gapes open .... **anomaliventris**
   Apex of abdomen normal .... **ambiguus**
3. Wings short, reaching to middle of abdomen .... **ottawensis**
   Wings fully developed 4
4. Face finely shagreened or punctulate 5
   Face rather coarsely rugose .... **harringtonii**
5. First three flagellar joints yellow .... **ottawensis** var.
   Flagellum entirely blackish .... **schwartzii**

°C. **anomaliventris** Ashmead.

Black, shining, head and thorax finely alutaceous. Antennæ brown-black. Legs reddish yellow, the posterior coxæ dark at base. Tip of abdomen in female compressed, widely gaping open so that the valves of the ovipositor project. Length 2.5 mm.

°C. **ambiguus** Ashmead.

Black, shining, finely alutaceous. Scape and legs brownish yellow, the posterior coxæ dark basally. Wings nearly hyaline, the stigmal vein less than twice the length of the stigma. Length 1.2-1.6 mm.

C. **schwartzii** Ashmead.

Black, finely shagreened, the scutellum smooth. Scape and legs brownish yellow, antennal scape brownish yellow, the flagellum piceous. Wings hyaline, the stigmal vein one and one-half times as long as the stigma. Length 1.6 mm.

Sachem's Head, 3 August, 1904, West Haven, 27 June, 1905, New Haven, 4 July, 1905 (H.L.V.).

°C. **harringtonii** Ashmead.

Black, the head and thorax with a fine reticulate punctation. Legs dull yellow; the posterior coxæ black and the others dusky. Scape and pedicel yellow, flagellum black. Length 2-2.5 mm.

°C. **ottawensis** Ashmead.

Smooth, shining black. Scape, pedicel, and first three flagellar joints yellow. Legs honey-yellow. Wings usually short, reaching only to the middle of the abdomen, but sometimes well developed. Length 2-2.5 mm.

Eumegaspilus Ashmead.

E. **erythrothorax** Ashmead.

Head and abdomen black or fuscous. Face, scape, thorax and petiole rufous or brownish yellow. Legs pale yellow. Wingless.

In nest of *Lasius umbratus mixtus aphidicola.*

Colebrook, August, 1900 (W. M. W.).

Ceraphron Jurine.

Key to Species.

1. Head, thorax, and abdomen black 3

Abdomen obscure rufous or piceous, yellowish at base and beneath 2
2. Flagellum of antennæ black ....**pallidiventris**
Flagellum brownish yellow basally ....**tertius**
3. Head and thorax distinctly and closely punctate ....**punctatus**
Head and thorax smooth or nearly so 4
4. Tegulæ black ....**pedalis**
Tegulæ pale ....**flaviscapus**

°C. **pallidiventris** Ashmead.

Black, the abdomen brownish, the venter yellow. Scape, part of pedicel, and legs pallid yellow. Tegulæ yellowish. Wings hyaline, the marginal cell almost closed. Body shining, but distinctly punctulate. Length 1.6 mm.

°C. **tertius** Dalla Torre.

Head and thorax polished black. Abdomen rufous, yellowish at the base. Legs brownish yellow. Wings subhyaline, slightly tinged; stigmal vein long and curved. Length 0.8-1.2 mm.

°C. **punctatus** Ashmead.

Black, finely and closely punctate, subopaque. Antennæ brownish yellow, apical half blackened. Tegulæ dull rufous or piceous. Wings subfuscous, stigmal vein long, almost forming a closed marginal cell. Legs brownish yellow. Length 1.1-1.6 mm.

°C. **pedalis** Ashmead.

Polished black, with some sparse, minute punctures. Antennæ black. Legs brownish yellow. Wings subhyaline, or slightly yellowish. Length 1.5 mm.

°C. **flaviscapus** Ashmead.

Polished black, impunctate. Scape, pedicel, and legs yellow or brownish yellow. Wings hyaline. Tegulæ yellowish. Length 1 mm.

Aphanogmus Thomson.

Key to Species.

1. Mesonotum with a median furrow ....**marylandicus**
Mesonotum without a furrow 2
2. Wings with a fuscous band ....**virginiensis**
Wings not banded ....**pallidipes**

°A. **virginiensis** Ashmead.

Polished black. Antennæ and legs fuscous; the scape, trochanters and tarsi whitish. Wings hyaline, with a fuscous band beneath the stigma. Length 1 mm.

°**A. marylandicus** Ashmead.

Polished black. Antennæ black. Legs dark brown, paler at the tips. Wings entirely hyaline. Length 1 mm.

°**A. pallidipes** Ashmead.

Shining black. Antennæ brownish yellow. Legs pale yellow. Wings clear hyaline, the nervures brown, the stigmal vein only a little longer than the marginal and but slightly curved. Length 0.8 mm.

DIAPRIIDÆ.

The present family is very similar in appearance to the following, but may be usually distinguished by the entire absence of a basal cell in the hind wings. The front wings are less distinctly veined, lacking the marginal cell so prominent in most Belytidæ. The antennal prominence is also usually less evident and the antennæ of the females more incrassated.

Key to Genera.

Females.

1. Wings normally developed 6
   Wings abbreviated or absent 2
2. Antennæ 13-jointed 3
   Antennæ 12-jointed 5
3. Antennæ with an abrupt 4-jointed club ....**Basalys** p. 568
   Antennæ without an abrupt club 4
4. Abdomen more or less rounded at apex and depressed; base of second abdominal segment raised dorsally above the petiole, without impression ....**Spilomicrus** p. 564
   Abdomen ending conically and compressed; base of second segment not raised above the petiole ......**Parimesius** p. 563
5. Club of antenna abrupt, 3-jointed ....**Loxotropa** p. 565
   Club of antenna 5-jointed or antennæ not distinctly clubbed **Aneurynchus** p. 564
6. Wings emarginate or truncate at the tip ......**Entomacis** p. 563
   Wings rounded at the tip 7
7. Antennæ 13-jointed 8
   Antennæ 12-jointed 11
8. Subcostal vein not exceeding the basal third of the wing .... **Basalys** p. 568
   Subcostal vein exceeding the basal third of the wing 9

9. Marginal vein punctiform; abdomen broadly truncate at the apex of the second segment, at which point it is broadest **Hemilexis**

Marginal vein large, quadrangular or linear; abdomen not truncate 10

10. Tip of abdomen rounded and depressed; base of second segment usually raised above the surface of the petiole; marginal vein once or twice as long as broad .... **Spilomicrus** p. 564

Abdomen conically pointed and compressed at tip; base of second segment not raised; marginal vein linear, three or four times as long as broad ....**Paramesius** p. 563

11. Face much produced, horizontal; mandibles rostriform, extending to the prosternum ....**Galesus** p. 564

Face normal; mandibles not thus prolonged 12

12. Subcostal vein not attaining the border of the wing; stigmal vein separated from the costa ....**Aneurhynchus** p. 564

Subcostal vein attaining the costal margin of the wing 13

13. Wings with a well-marked basal vein; antennal club 3-jointed **Loxotropa** p. 565

Wings without basal vein 14

14. Scutellum without depressions at the base ....**Phænopria** p. 567

Scutellum with one or two basal impressions 15

15. Scutellum carinate or ridged medially 16

Scutellum flat or feebly convex ....**Trichopria** p. 566

16. Club of antennæ abrupt, 3-5-jointed; basal margin of second abdominal segment simple ....**Ashmeadopria** p. 566

Club of antennæ gradual, 6-jointed; basal margin of second abdominal segment raised and angularly emarginate ..... **Diapria** p. 565

Males.

1. Antennæ 14-jointed 2

Antennæ 13-jointed 10

2. Third joint of antennæ angulate or emarginate, fourth joint simple; no parapsidal furrows ....**Ashmeadopria** p. 566

Third joint of antennæ simple; fourth joint sometimes angulate 3

3. Wings absent or abbreviated ....**Loxotropa** p. 565

Wings fully developed 4

4. Scutellum without any impression at the base **Phænopria** p. 567

Scutellum with one or two impressions at the base 5

5. Subcostal vein not attaining the margin of the wing .... **Aneurhynchus** p. 564

Subcostal vein attaining the margin of the wing, or absent 6

6. Mandibles rostriform, attaining the prosternum; face produced behind ....**Galesus** p. 564

Mandibles normal; face not produced 7

7. Wings with a well-marked basal vein ....**Loxotropa** p. 565
Wings without basal vein 8
8. Scutellum medially carinate 9
Scutellum flat or weakly convex ....**Trichopria** p. 566
9. Flagellum of antennæ with long, irregularly placed hairs; anterior margin of second abdominal segment raised and emarginate ....**Diapria** p. 565
Flagellum verticillate with long hairs; anterior margin of second abdominal segment not raised nor emarginate. .... **Ashmeadopria** p. 566
10. Wings emarginate or truncate at tip ....**Entomacis** p. 563
Wings rounded at tip 11
11. Third joint of antennæ less than half as long as the fourth **Paramesius** p. 563
Third joint of antennæ at least nearly as long as the fourth 12
12. Base of second abdominal segment raised above the petiole without impression ....**Spilomicrus** p. 564
Base of second abdominal segment not raised .....**Hemilexis**

Entomacis Foerster.

°**E. subemarginata** Ashmead.

Polished black, smooth. Legs and antennæ yellow. Apex of anterior wing emarginated; stigmal vein longer than the marginal. Length 1.3-1.8 mm.

*__E. ambigua__ Brues.

Shining black. Legs and antennæ, except apex, rufous. Mesothorax with distinct furrows, the scutellar fovea deep and broad, longitudinally fluted. Wings obsoletely emarginate at the apex. Length 2.5 mm.

Type locality: Colebrook, living in nests of *Stenamma fulvum piceum*.

Paramesius Westwood.

Key to Species.

1. Wings hyaline ....**parvulus**
Wings fuscous or fusco-hyaline 2
2. Scutellum with two foveæ at base ....**spinosus**
Scutellum with a single fovea at base ....**pallidipes**

°**P. parvulus** Ashmead.

Shining black, with some sparse hairs. Legs and antennæ brownish yellow; flagellum twice as long as the scape, the five or six terminal joints fuscous or black, the last enlarged, about three times as large as the penultimate. Length 1.5 mm.

°**P. spinosus** Ashmead.

Polished black, with some sparse gray hairs. Antennæ, except three terminal joints, and legs reddish yellow; last joint of antennæ a little longer and thicker than the penultimate. Length 3 mm.

°**P. pallidipes** Ashmead.

Polished black, with a few fuscous hairs. Antennæ and legs rufous, the last four antennal joints blackish, the last twice as long as the penultimate. Length 2-3 mm.

Spilomicrus Westwood.

°**S. flavicornis** Ashmead.

Polished black. Antennæ and legs brownish yellow. Scutellum at base with two almost confluent foveæ. Mesonotum with delicate furrows. Wings hyaline, the veins yellowish. Length 1.4 mm.

Aneurhynchus Westwood.

°**A. floridanus** Ashmead.

Black, sparsely pubescent. Antennæ, legs, mandibles, palpi, and tegulæ pale brownish yellow. Frontal ridge of male pale rufous. Abdomen smooth, impunctate above and below. Length 3 mm.

Galesus Curtis.

Key to Species.

1. Wings with a deep emargination at apex ....**politus**
   Wings entire at apex 2
2. Antennæ rufous at base, joints longer than wide ......**viereckii**
   Antennæ black at base, joints not longer than wide ......**pilosus**

°**G. politus** Say.

Black. Legs, including coxæ, honey-yellow or pale rufous. Head nearly twice as long as wide. Wings with a deep fissure at the apex. Length 2.2-3.6 mm.

***G. viereckii** Brues.

Black, first three antennal joints brown. Legs, except coxæ, rufous-yellow. Wings entire at the apex. Length 3.5 mm.

Type locality: Colebrook, 21 June, 1905 (H. L. V.).

°**G. pilosus** Ashmead.

Black, pilose, the head only a little longer than wide. Antennal scape and the coxæ black. Legs rufous. Flagellum brown. Abdomen impunctate at apex. Length 2 mm.

Loxotropa Foerster.

Key to Species.

Females

1.	Winged	2
	Subapterous	**nana**
2.	Upper part of front angulated in front of eyes	**ruficornis**
	Front smooth, not angulated	3
3.	Scutellum with one large transverse fovea	**abrupta**
	Scutellum with two small confluent foveæ at base	**flavipes**

°**L. nana** Ashmead.

Head and abdomen black, thorax rufous. Legs and antennæ, except club, brownish yellow. Wings narrow, not reaching to the tip of the abdomen. Scutellum with a small rounded fovea at the base. Length 1 mm.

°**L. ruficornis** Ashmead.

Black. Antennæ, except club, rufous. Legs, including coxæ, reddish yellow. Scutellum with a large fovea at the base. Wings hyaline, the abdominal petiole finely sculptured. Length 1.6 mm.

°**L. abrupta** Thomson.

Black. Antennæ, except the 3-jointed club, and the legs rufous. Scutellum with a fovea across the base, connected with lateral grooved lines. Wings subhyaline, the abdominal petiole rugose. Length 1.8-2 mm.

°**L. flavipes** Ashmead.

Polished black. Antennæ, except the club, and the legs brownish yellow or reddish yellow. Wings hyaline. Scutellum with two more or less confluent foveæ at the base, the lateral grooved lines absent anteriorly. Length 1.3-1.6 mm.

Diapria Latreille.

D. conica Fabricius.

Black, more or less woolly. Antennæ, mandibles, and legs rufous; the scape darker, and the five apical joints black. Abdomen longer than the head and thorax together. Length 2.5 mm.

This species is parasitic on the drone-fly or chrysanthemum fly (*Eristalis tenax*).

Waterbury, 28 July, 1879, 18 May, 1884 (W. H. P.).

Ashmeadopria Kieffer.

°**A. carinata** Thomson.

Black, more or less woolly. Antennæ, mandibles, coxæ, and thickened parts of femora and tibiæ piceous or brown-black; rest of legs rufous. Abdomen not longer than the head and thorax united. Length 2.5 mm.

Trichopria Ashmead.

Key to Species.

1. Antennal club 5-jointed 2
Antennal club 4-jointed 4
Antennal club 3-jointed 7
2. Antennæ black .... carolinensis
Antennæ reddish or rufous at base 3
3. Scutellum unifoveate .... pentaplasta
Scutellum bifoveate .... rufipes
4. Antennæ and legs in great part piceous or black 5
Antennæ except club, and legs, rufous or yellowish 6
5. Abdominal petiole not or scarcely longer than thick.... popenoei
Abdominal petiole distinctly longer than thick.......... columbiana
6. Antennal club entirely black .... virginica
Only the three terminal joints of the club black...... tetraplasta
7. Legs uniformly reddish yellow .... erythrops
Legs piceous, tarsi and joints lighter .... agromyzæ

°**T. pentaplasta** Ashmead.

Black. Antennæ, except the club, and legs reddish yellow. Pedicel a little shorter than the first flagellar joint. Antennal club black, the first joint oblong, second, third and fourth quadrate, equal, the fifth longer but not thicker. Length 1.5 mm.

°**T. popenoei** Ashmead.

Black and shining, including antennæ; legs with trochanters, base of tibiæ, and tarsi pale rufous or piceous; antennal club of female with first joint small, rounded; second larger, cup-shaped; third quadrate. Length 1.5 mm.

°T. **carolinensis** Ashmead.

Black and shining, including antennæ; legs pale rufous, base of coxæ and clavate portion of femora and tibiæ darker; second joint of club of female antennæ round; third and fourth submoniliform, slightly wider than long. Length 2 mm.

°T. **rufipes** Ashmead.

Black and shining; antennæ except last four joints, and the legs, rufous; second joint of club of female antennæ much wider than the first; third and fourth quadrate. Length 2-2.2 mm.

°T. **erythropus** Ashmead.

Polished black. Antennæ, except club, and legs reddish yellow. Metathorax and petiole piceous. Wings hyaline, strongly fringed. Length 1.6-2 mm.

°T. **agromyzæ** Fitch.

Black, shining. Antennæ piceous-black. Legs honey-yellow; the hind coxæ and the thickened parts of the femora and tibiæ blackish. Length 1.5 mm.

Parasitic on *Agromysa tritici,* according to Fitch.

°T. **tetraplasta** Ashmead.

Black. Antennæ, except the apical three joints of the club, rufous. Legs pale rufous or reddish yellow. Wings fusco-hyaline. Length 1.6 mm.

°T. **colon** Say.

Black, smooth, and polished. Legs black, with the trochanters, knees, and tarsi piceous or brown. Wings subhyaline, strongly fringed, with a fuscous streak below the stigma. Length 1.1 mm.

°T. **virginica** Ashmead.

Polished black. Antennæ, except the club, and the legs reddish yellow. Wings clear hyaline, the stigma yellowish. Scutellum with a shallow transverse fovea at the base. Length 1.5 mm.

Phænopria Ashmead.

Key to Species.

Females.

1. Antennal club 3-jointed 2
   Antennal club 4-jointed .... **schwartzii**

2. Antennæ, except club, reddish .... **virginica**
   Antennæ entirely piceous or black 3
3. Legs entirely reddish yellow .... **hæmatobiæ**
   Legs rufous; coxæ, femora, and tibiæ fuscous ...... **minutissima**

°**P. minutissima** Ashmead.

Polished black. Antennæ piceous, with rufous scape. Coxæ, clavate part of femora, and tibiæ piceous. Wings hyaline, the stigma piceous. Length 0.9 mm.

°**P. hæmatobiæ** Ashmead.

Shining black. Antennæ piceous, with rufous scape. Legs uniformly reddish yellow. Cheeks each with a tuft of grayish woolly pubescence. Length 0.8 mm.

Parasitic on the horn-fly (*Hæmatobia serrata*).

°**P. virginica** Ashmead.

Polished black, impunctate. Antennæ, except club, and legs reddish yellow or yellowish. Cheeks behind, collar, and petiole woolly. Metathorax pubescent. Wings hyaline, fringed; the stigma long, brownish. Head thick, globose. Length 1.1 mm.

°**P. schwartzii** Ashmead.

Polished black. Antennæ, except club, and legs reddish yellow or yellowish; club fuscous. Wings hyaline, the stigma yellowish. Length 1-1.2 mm.

Basalys Westwood.

°**B. fuscipennis** Ashmead.

Polished black. Cheeks and collar with dense gray wool. Antennæ, legs, and petiole brownish yellow. Wings fuscous, marginal vein piceous, with a cloud below its tip. Length 2.7 mm.

BELYTIDÆ.

Head transverse or subglobose, with the 14- or 15-jointed antennæ inserted on a frontal prominence. Wings with a closed costal cell, basal cell, and usually a marginal cell. Hind wings always with a basal cell. Abdomen petiolate. Wingless forms rare.

Key to Genera.

Females.

1. Antennæ 15-jointed 2
   Antennæ 14-jointed .... **Anectata** p. 573

2. Abdomen with only three or four segments 3
Abdomen with seven or eight dorsal segments 4
3. Second abdominal segment not greatly lengthened, third long and strongly compressed from sides **Leptorhaptus** p. 570
Second abdominal segment very much lengthened, extending nearly to tip of abdomen, third issuing from it as a short stylus .... **Cinetus** p. 570
4. Abdomen with eight dorsal segments 5
Abdomen with seven segments .... **Acropiesta** p. 570
5. Eyes bare .... **Psilomma** p. 573
Eyes hairy 6
6. Middle carina of metanotum not divided 7
Middle carina of metanotum divided or absent.... **Belyta** p. 571
7. Postscutellum normal, unarmed 8
Postscutellum armed with a strong spine .... **Oxylabis** p. 571
8. Third dorsal abdominal segment not or very little longer than fourth 10
Third dorsal abdominal segment much longer than fourth .. 9
9. Mandibles small and short .... **Miota** p. 571
Mandibles long, falcate .... **Xenotoma** p. 572
10. Marginal cell closed 11
Marginal cell open at apex 12
11. Stigmal vein straight from margin .... **Zelotypa** p. 572
Stigmal vein oblique .... **Pantoclis** p. 572
12. Stigmal vein perpendicular to the margin .... **Zygota** p. 572
Stigmal vein oblique .... **Aclista** p. 573

Males.

1. Petiole of abdomen nearly twice as long as metathorax 2
Petiole of abdomen not or scarcely longer than metathorax.. 4
2. Second abdominal segment compressed laterally, petiole above smooth 3
Second segment not compressed laterally, petiole above more or less furrowed .... **Cinetus** p. 570
3. Antennal scape as long as first funicular joint .... **Leptorhaptus** p. 570
Antennal scape shorter than first funicular joint .... **Miota** p. 571
4. Middle carina of metathorax not divided 5
Middle carina of metahorax divided or absent .... **Belyta** p. 571
5. Postscutellum simple, not spined 6
Postscutellum armed with a strong spine .... **Oxylabis** p. 571
6. Eyes hairy 7
Eyes bare, mesonotum with furrows .... **Psilomma** p. 573
7. Scape with apical margin on one side produced into a tooth **Acropiesta** p. 570
Scape normal, not toothed at apex 8
8. Marginal cell completely closed 9
Marginal cell open at apex 12

9. Marginal vein not, or only a little, longer than stigmal vein 10
Marginal vein at least twice as long as stigmal .... **Zelotypa** p. 572
10. Mandibles normal, small 11
Mandibles large, falcate, crossing at tips ......**Xenotoma** p. 572
11. Last ventral segment straight and punctate ....**Anectata** p. 573
Last ventral segment somewhat bent, impunctate .... **Pantoclis** p. 572
12. Stigmal vein perpendicular ....**Zygota** p. 572
Stigmal vein very oblique ....**Aclista** p. 573

Leptorhaptus Foerster.

Key to Species.

Abdomen principally black ....**conicus**
Abdomen principally rufous ....**rufus**

L. conicus Ashmead.

Shining black. Antennæ, mandibles, palpi, tegulæ, and legs brownish yellow. Female antennæ as long as the body. Length 3-4 mm.

Branford, 28 July, 1905 (H.L.V.).

°**L. rufus** Ashmead.

Male entirely rufous, with the appendages lighter. Female with the head, thorax, and petiole black; antennæ extending only to the base of the abdomen. Length 4-4.5 mm.

Cinetus Jurine.

°**C. coloradensis** Ashmead.

Polished black, pubescent. Scape very long, nearly twice as long as the first flagellar joint. Metathorax smooth, tricarinated, marginal cell as long as the marginal vein. Length 3 mm. (female).

°**C. americana** Ashmead.

Black, polished, pubescent. Antennæ and legs pale brownish yellow. Metathorax carinated, pubescent. Marginal cell shorter than the marginal vein. Length 3 mm. (male).

Acropiesta Foerster.

°**A. flavicauda** Ashmead.

Black, shining, with terminal segment of abdomen yellow; antennæ and legs rufous; wings of female feebly developed. Length 3 mm.

°**A. subaptera** Ashmead.

Head black; thorax and abdomen piceous brown; antennæ piceous, the scape and pedicel brownish yellow; legs brownish yellow; wings of female abbreviated. Length 2.2 mm.

Belyta Jurine.

Key to Species.

Marginal cell closed	**erythropus**
Marginal cell open at apex	**texana**

°**B. erythropus** Ashmead.

Shining black. Antennæ and legs rufous or reddish yellow. Wings subfuscous. Abdominal petiole striate. Length 3-4.5 mm.

°**B. texana** Ashmead.

Polished black. Antennæ reddish, darker toward the tips in the male. Legs reddish yellow. Wings hyaline, petiole rugose, without any raised lines. Length 3-4 mm.

Oxylabis Foerster.

Key to Species.

Scutellum with a single fovea at base	**spinosa**
Scutellum with two foveæ at base	**bifoveolata**

°**O. spinosa** Provancher.

Black. Legs and antennæ rufous. Wings subfuscous, the marginal cell almost closed. Length 2.5 mm.

°**O. bifoveolata** Brues.

Black. Legs fuscous, varied with rufous. Antennæ fuscous, black at the base. Wings hyaline, the marginal cell completely closed. Length 3 mm.

Miota Foerster.

Key to Species.

Marginal cell twice as long as marginal vein	**mellipes**
Marginal cell three times length of marginal vein	**similis**

°**M. mellipes** Say.

Polished black. Female antennæ filiform, the flagellum fuscous. Legs honey-yellow. Length 2.5 mm.

°**M. similis** Ashmead.

Polished black. Base of antennæ and legs honey-yellow. Antennal scape four times as long as the first flagellar joint. Length 2.8 mm.

Xenotoma Foerster.

°**X. xanthopus** Ashmead.

Polished black, except the abdomen and thorax in part. Marginal cell two and one-half times the length of the marginal vein. Length 2.4-3 mm.

°**X. mandibularis** Ashmead.

Black. Thorax and abdomen more or less rufous. Marginal cell scarcely twice the length of the marginal vein. Length 2.5 mm.

Zelotypa Foerster.

°**Z. longicornis** Ashmead.

Polished black, pubescent. Antennæ fuscous yellow at base. Tegulæ and legs brownish yellow. Wings subfuscous. Abdomen rufous at base. Marginal cell two and one-half times as long as the marginal vein. Length 3.2 mm.

Pantoclis Foerster.

°**P. insularis** Ashmead.

Black. Antennæ and legs brownish yellow. Antennæ subclavate. Marginal cell twice as long as the marginal vein. Metathorax smooth on the disc, with three keels. Length 2-3 mm.

°**P. analis** Ashmead.

Black. Antennæ rufous except tips. Abdomen rufo-piceous, the tip reddish yellow. Marginal cell about five times the length of the marginal vein. Legs pale rufous or brownish yellow. Length 3.2 mm.

Zygota Foerster.

°**Z. californica** Ashmead.

Shining black, covered with a fuscous pubescence. Antennæ 14-jointed, brown-black. Legs brownish yellow. Wings subfuscous, marginal cell closed. Length 3.5-4 mm.

Aclista Foerster.

A. rugosopetiolata Ashmead.

Polished black, pubescent. Scutellum with two foveæ connected by a furrow. Antennæ usually stout. Metathorax rugose, carinated. Legs brownish yellow. Length 2.6 mm.

Psilomma Foerster.

°**P. columbianum** Ashmead.

Polished black. Antennæ and legs rufous. Wings subfuscous, the marginal vein punctiform; marginal cell long and open, faintly indicated. Metathorax subquadrate, rugose. Length 3.5-4 mm.

Anectata Foerster.

°**A. hirtifrons** Ashmead.

Black, shining, pubescent, the face with dense whitish pubescence. Antennæ rufous. Legs rufous or brownish yellow. Wings hyaline, the marginal cell twice the length of the marginal vein. Antennæ subfiliform in the female. Length 3.4 mm.

SERPHIDÆ.

Key to Genera.

Parapsidal furrows distinct, or at least well indicated ...... **Disogmus** p. 573
Mesonotum without trace of furrows .... **Serphus** p. 573

Disogmus Foerster.

***D. obsoletus** Brues.

Shining black, more or less brownish. Antennæ brownish yellow, darker at the tips. Mesonotum with indications of furrows anteriorly. Legs brownish yellow; tips of tarsi blackish. Length 2.5 mm.

Type locality, Morris Cove, 20 May, 1904 (H. L. V.).

Serphus Schrank.

The species of this extensive genus are recognized by the 13-jointed antennæ, edentate mandibles, smooth convex mesonotum, and abdominal stylus of the female. The hypopygium of the male ends in two short spines.

Key to Species.

1.	Head and thorax black	2
	Head and mesonotum pale or rufous	10
2.	Abdomen black	3
	Abdomen in great part reddish or yellowish	8
3.	Discoidal nervures entirely wanting	4
	Discoidal nervures more or less indicated by fuscous streaks	**californicus**
4.	Marginal cell much shorter than stigma	5
	Marginal cell large; as long as stigma	**flavipes**
5.	Cauda short, not, or scarcely one-third, the length of abdomen	7
	Cauda as long as abdomen	**clypeatus**
6.	Metanotum above smooth, with three carinæ	7
	Metanotum rugose above, with a single median keel	**carolinensis**
7.	Coxæ black or dusky above	**abruptus**
	Coxæ entirely pale	**obsoletus**
8.	Metathorax with a median carina	9
	Metathorax without a distinct median carina	**caudatus**
9.	Coxæ black	**linellii**
	Coxæ pale	**melliventris**
10.	Metathorax coarsely rugose, with longitudinal raised lines	**caudatus**
	Metathorax rugose but not longitudinally striated	**pallidus**
11.	Metathorax twice as long as high	**longiceps**
	Metathorax shorter	**quadriceps**

S. caudatus Say.

Reddish testaceous. Metathorax black, and upper part of mesothorax and sutures often blackened. Metathorax coarsely rugose, with longitudinal raised lines, but without a distinct central longitudinal carina. Cauda as long as the abdomen. Length 7-10 mm.

Salisbury, 27, 30 August, 1904, Kent, 31 August, 1904 (W. E. B.).

°**S. pallidus** Say.

Reddish testaceous. Metathorax more finely rugose than in *caudatus,* and with a median carina. Cauda half the length of the abdomen. Length 6-9 mm.

°**S. linellii** Ashmead.

Black. Legs, except coxæ, rufous, and abdomen rufous except the last three segments. Hind tibial spur one-third the length of the metatarsus. Length 4 mm. (male).

S. melliventris Ashmead.

Head and thorax black. Abdomen yellow, the petiole and the tip black. Legs yellow, hind tibial spur one-third the length of the metatarsus. Length 4-5 mm. (male).

New Haven, 31 October, 1903 (H. L. V.).

S. californicus Holmgren.

Black. Legs, except coxæ, and antennæ beneath reddish. Antennæ with first to fifth joints of flagellum dentate beneath. Length 4-4.5 mm. (male).

New Haven, 31 October, 1903 (H. L. V.).

°**S. flavipes** Provancher.

Black. Mandibles, tegulæ, and legs, including coxæ, pale yellow. Marginal cell as long as the stigma. Posterior tibial spur two-thirds the length of the metatarsus. Length 3.5-4.5 mm.

°**S. clypeatus** Ashmead.

Black. Clypeus and mandibles rufous. Legs, including coxæ, yellowish. Cauda longer than the abdomen, reddish basally. Tibial spur of posterior leg one-half the length of the metatarsus. Length 4.5 mm.

°**S. abruptus** Say.

Black. Legs reddish yellow, coxæ often in part black. Cauda only one-fourth the length of the abdomen. Length 2.5-3 mm.

°**S. obsoletus** Say.

Larger than *abruptus* and with the antennæ almost wholly yellow. Length 4 mm.

Parasitic on *Stelidota strigosa*.

S. carolinensis Ashmead.

Black. Antennal scape, tegulæ, and legs yellow; coxæ dusky at base. Metathorax with a single carina extending to the tip. Posterior tibial spur half the length of the metatarsus. Length 5-5.5 mm.

Putnam, 12 July, 1905 (H. L. V.).

°**S. longiceps** Ashmead.

Black. Antennæ, except tips, yellowish. Legs reddish yellow. the coxæ dusky. Metathorax weakly rugulose, with a median carina. Cauda as long as the metatarsus. Spur of posterior tibiæ one-third as long. Length 7 mm.

S. quadriceps Ashmead.

Black. Legs reddish yellow, with dusky coxæ. Antennæ rufous-yellow. Metathorax with a median carina and a large smooth area on each side. Cauda as long as the hind metatarsus. Posterior tibial spur a little less than one-half the length of the metatarsus. Length 4 mm.

New Haven, 31 October, 1903 (H. L. V.).

HELORIDÆ.

Helorus Latreille.

Tarsal claws pectinate; wings with the basal nervure abruptly broken and bent downwards, forming a triangular discoidal cell. Antennæ 15-jointed.

H. paradoxus Provancher.

Shining black. Tegulæ and legs pale rufous; the coxæ black, and the femora darker toward the base. Wings hyaline. Length 4-5 mm.

Parasitic on the cocoons of *Chrysopa*.

Stafford, 24 August, 1905 (W. E. B.).

PELECINIDÆ.

Pelecinus Latreille.

A single species occurs very commonly within the state. It is the largest of all the Serphoidea found here.

P. polyturator Drury. Pl. ix, Fig. 1.

Black. Annulus on antennæ and male tarsi whitish. Abdomen of female about five times the length of the head and thorax, composed of six slender cylindrical segments. Abdomen in male clavate, the petiole as long as the abdomen, about the length of the head and thorax. Length: female 50-60 mm., male 22 mm.

Parasitic on the grubs of May beetles of the genus *Lachnosterna*.

New Haven, 24 August, 1904, 7, 18 August, 1906, Cheshire, 18 August, 1906 (P. L. B.); Scotland, 10 August, 1905 (B. H. W.); Suffield, 26 July, 1906, New Haven, 14 August, 1906 (W. E. B.).

FORMICOIDEA.

FORMICIDÆ.

By William Morton Wheeler.

The ants (family Formicidæ) are social Hymenopterous insects, and may be distinguished from the social bees and wasps by having workers, or neuters, as they are less appropriately called, without wings. They are, moreover, readily distinguished from these and all other Hymènopterous insects by the following characters:

1. The first antennal joint in the workers and females, and often also in the males, is greatly elongated and forms what is known as the scape. The remaining shorter joints, constituting the funiculus, or flagellum, are articulated at an angle with the scape and can be folded up against it.

2. One or two of the segments of the base of the abdomen are much reduced in size to form a pedicel, and these segments are either nodiform or bear an erect or inclined scale. When only one of these segments is present, it is known as the petiole; when two are present, the first is the petiole, the second the postpetiole. The swollen portion of the abdomen behind the pedicel is known as the gaster, and has one more visible segment in the male than in the female (queen).

3. The legs of ants are distinguished from those of many other Hymenoptera in having only one instead of two small joints (trochanters) between the hip (coxa) and femur.

4. The venation of the wings of male and female ants is much simplified and differs considerably from that of other Hymenoptera. The female, or queen ant, unlike the queens of the social bees and wasps, loses her wings after fertilization.

The colonies of all our northern ants nest either in the ground or in decaying wood. The nests, or formicaries, may be under stones or logs, and always consist of irregularly excavated, intercommunicating cavities, unlike the regular paper or waxen combs of other social Hymenoptera. Often the nests are surmounted by earthen craters or dome-shaped mounds, or "hills." The latter are perforated with cavities which serve as incubators for the young, that is, for the minute eggs, the legless, grub-like larvæ, and the pupæ. The pupæ are either naked or enclosed in elliptical cocoons which are spun by the mature larvæ.

Many species of ants harbor in their nests messmates or parasites belonging to various groups of insects. Some of these so-called myrmecophiles are fed and cared for by the ants, others prey upon the ants or their brood. Certain species of ants may themselves become parasitic on other ants. A few of these parasitic species have lost their worker caste completely, and are, therefore, represented only by male and female individuals like the non-social Hymenoptera.

The food of ants consists primarily of other insects found dead or in a moribund or helpless condition on the ground or vegetation. Many species, however, feed on honey-dew, and either collect this sweet liquid directly from the plant-lice and scale insects of which it is the excrement, or lap it up from the surfaces of the leaves on which it has fallen. Ants are, on the whole, beneficial insects, since they consume enormous numbers of dead and decomposing organisms. Many of the less abundant species are neither beneficial nor noxious. A few, like the little red house-ant (*Monomorium pharaonis*) and the large black carpenter-ant (*Camponotus pennsylvanicus*), are sometimes a pest in houses. Both of these species are very fond of feeding on sweets in pantries, kitchens, etc., and the carpenter-ant also has the injurious habit of excavating its galleries in the beams and rafters of houses. A few species, like the garden ant (*Lasius americanus*) and the silky ant (*Formica subsericea*), disfigure lawns and garden beds with their burrows and craters.

The following list of ants occurring in Connecticut has been prepared at the suggestion of Dr. W. E. Britton from material collected by himself, Mr. H. L. Viereck, and others in various parts of the state, and from my own collections made during several summers in the vicinity of Colebrook, Winsted, and Norfolk in the Litchfield Hills. This list is probably very incomplete, as I have found several species in adjacent portions of New York (*e. g.*, near White Plains), not represented in the material from Connecticut. Previous authors have recorded from the latter state several species which I have had to discard. Mayr ascribed to Connecticut *Pogonomyrmex subdentatus*, an ant known to occur only in the arid deserts of the Southwest; and Buckley described the following species from the same state: *Formica nortonii*, *F. americana*, *F. connecticutensis*, *F. gnava*, *F. occidentalis*, and *Myrmica* (*Diplorhoptrum*) *scabrata*. With the exception of *F. gnava*, none of these forms can be recognized from Buckley's abominable descriptions. Under *F. gnava* he evidently included several different ants. One of these, a form of *F. fusca* intermediate between the varieties *subsericea* Say and *neorufibarbis* Emery, I have been able to recognize in the Texan fauna, and I have therefore restricted Buckley's name to this particular variety. With this single exception, however, all of the above names of Buckley's Formicidæ may be consigned to oblivion.

As the worker caste is the best known and most commonly met with, it is the only one used for identification in the tables published in the following pages. These tables include the subfamilies, genera, and subgenera known to occur in North America north of Mexico. Of the five subfamilies only four are represented in the Northern States, the remaining one (Dorylinæ) being confined to tropical and subtropical regions.

Key to Subfamilies.

1. Cloacal orifice ventral, slit-shaped; sting well developed or vestigial; abdominal pedicel consisting of one or two segments 2

Cloacal orifice terminal, circular, surrounded by a fringe of hairs; abdominal pedicel consisting of only a single segment; no constriction between the first and second gastric segments; pupæ usually enclosed in cocoon .... CAMPONOTINÆ p. 590

2. Sting developed, sometimes very small but nevertheless exsertile; abdominal pedicel consisting of one or two segments; when of only one, a distinct constriction between first and second gastric segments 3

Sting vestigial; abdominal pedicel consisting of a single segment; no constriction between first and second gastric segments; anal glands which produce a secretion with a peculiar rancid-butter odor ("Tapinoma odor") often present; pupæ naked ..................DOLICHODERINÆ p. 589

3. Pupæ always enclosed in cocoons; abdominal pedicel consisting of a single segment; gaster with a distinct constriction between its first and second segments; frontal carinæ

separated or close together; when close together, dilated to form oblique or horizontal laminæ partly covering insertions of antennæ .... PONERINÆ p. 580
Pupæ naked; abdominal pedicel consisting of two segments 4
4. Frontal carinæ very close together, almost vertical, not at all covering antennal insertions; eyes always very small or absent; tropical and subtropical .... DORYLINÆ
Frontal carinæ of a different conformation and covering the antennal insertions; eyes rarely vestigial or absent; cosmopolitan .... MYRMICINÆ p. 581

PONERINÆ.

Key to Genera.

1. Frontal carinæ closely approximated; antennæ inserted very near oral margin; tip of gaster strongly deflected downward 2
Frontal carinæ of a different conformation; tip of gaster not deflected downward 3
2. Front of clypeus projecting in middle; petiole nodiform **Sysphincta**
Clypeus not projecting in middle; petiole surmounted by a scale .... **Proceratium**
3. Mandibles linear, inserted close together at middle of oral border; petiole terminating in a point or spine above **Odontomachus**
Mandibles inserted at corners of head; petiole rounded or flattened above 4
4. Antennæ very thick and robust 5
Antennæ not greatly thickened 6
5. Pygidium with a row of prominent prickles on its lateral border; last antennal joint not greatly enlarged .... **Acanthostichus**
Pygidium without prominent prickles on its lateral border; last antennal joint greatly enlarged .... **Cerapachys**
6. Mandibles long and slender, with coarse, bidenticulate teeth; clypeus with numerous teeth on its anterior border; petiole not constricted posteriorly .... **Stigmatomma** p. 581
Of a different conformation 7
7. Claws pectinate 8
Claws simple 9
8. Mandibles edentate, slender; without distinct apical border **Leptogenys** (*s. str.*)
Mandibles broader, generally toothed; with distinct apical border .... **Leptogenys (Lobopelta)**
9. Median spur of mid and hind legs alone developed; lateral spurs lacking; small species with vestigial eyes.. **Ponera** p. 581

Both spurs of mid and hind legs well developed; medium or large species, with larger eyes 10

10. Cheeks with a longitudinal carina ....**Neoponera**

Cheeks without a carina 11

11. Pronotum more or less marginate on sides; mid tibiæ not abbreviated nor beset with prominent bristles .... **Pachycondyla** (*s. str.*)

Pronotum not marginate on sides; mid tibiæ short, with prominent bristles on their exterior surfaces .... **Euponera (Pseudoponera)**

Stigmatomma Roger.

S. pallipes Haldeman, var **wheeleri** Santschi.

This singular and primitive ant is subterranean or hypogæic in its habits, and occurs only in rich, rather damp woods, under stones, leaf-mold, or more rarely under rotten logs. It is by no means common. The colonies are small, comprising in extreme cases from forty to sixty individuals. The males and winged females appear in August and early September.

Suffield (Geo. Dimmock); Colebrook (W. M. W.).

Ponera Latreille.

P. coarctata pennsylvanica (Buckley) Emery.

Like the preceding, this small, slender species lives in small colonies, but is much more abundant. It nests under stones and vegetable mold, in rotten logs, etc., in rather open woods, along hedges, etc. The males and winged females appear in late August and early September.

Colebrook (W. M. W.).

MYRMICINÆ.

Key to Genera.

1. Workers absent ....**Epœcus** ; **Sympheidole**; **Epipheidole**

Workers present 2

2. Clypeus not extending back between frontal carinæ, which are closely approximated; antennæ 12-jointed .... **Pseudomyrma**

Clypeus almost always extending back between frontal carinæ, which are more or less separated; in the opposite case antennæ 11-jointed 3

3. Antennal fossæ prolonged as grooves for antennal scapes

along sides of head dorsal to eyes and covered by extended lateral margins of head; antennæ 11-jointed ...... **Cryptocerus**

Antennal fossæ of a different conformation or antennæ of a different number of joints 4

4. Postpetiole articulated to dorsal surface of gaster, which is flattened dorsally, more convex ventrally, and pointed at tip ....**Crematogaster** p.

Postpetiole inserted at anterior end of gaster, which is of the usual shape 5

5. Antennæ 6-jointed; head cordiform, antennal fossæ as long as scapes ....**Strumigenys**

Antennæ with more than six joints 6

6. Antennæ 11-jointed; without a distinct club or with a club consisting of only a single joint ....

Antennal club consisting of several joints, or antennæ not 11-jointed ....

7. Integument rough, bearing stiff or hooked hairs ....

Integument smoother; hairs scale-like and appressed ...... **Cyphomyrmex**

8. Large species; workers highly polymorphic; head with a pair of occipital spines only; thorax with three pairs of dorsal spines or tubercles ....**Atta** (s. st

Small species; workers monomorphic or feebly polymorphic; thoracic dorsum with four pairs of spines or tubercles ....

9. Head broad with rounded occipital lobes, without supraocular spines or tubercles ....**Atta (Moellerius)**

Head narrow, with angular occipital lobes; body rough, covered with small tubercles ....**Atta (Trachymyrmex)**

10. Antennæ with a 2-jointed club ....

Antennal club, when developed, with more than two joints

11. Antennæ 10-jointed, epinotum unarmed.......**Solenopsis** p.

Antennæ 11-jointed, epinotum dentate ....**Erebomyrma**

12. Posterior margin of clypeus elevated in the form of a welt or ridge bordering antennal fossa in front ....

Posterior border of clypeus not thus elevated ....

13. Portion of clypeus in front of antennal insertion narrow but not reduced to a mere ridge; antennæ of male 10-jointed..

Portion of clypeus in front of antennal insertion reduced to a mere ridge; antennæ of male 13-jointed ..**Myrmecina** p.

14. Antennæ 12-jointed ....**Tetramorium** (s. st

Antennæ 11-jointed ....**Tetramorium (Xiphomyrmex)**

15. Antennæ 11-jointed ....

Antennæ 12-jointed ....

16. Thorax and petiole without any traces of teeth or spines; pronotum never angular 17
Epinotum armed with spines or teeth 18

17. Petiole distinctly pedunculate ....**Monomorium** p. 584
Petiole not pedunculate ....**Xenomyrmex**

18. Mesoëpinotal constriction distinct; males ergatomorphic **Symmyrmica**
Mesoëpinotal constriction faint or lacking; males not ergatomorphic ....**Lepthothorax** p. 588

19. Workers strongly dimorphic, usually without intermediates connecting the extreme forms; antennal club 3-jointed, longer than remainder of funiculus ....**Pheidole** p. 584
Workers monomorphic or polymorphic, *i. e.*, with mediæ intermediate between major and minor forms; antennal club indistinct or shorter than remainder of funiculus 20

20. Last three antennal joints much shorter than remainder of funiculus and not forming a distinct club 21
Last three antennal joints forming a distinct club nearly as long as remainder of funiculus 26

21. Thoracic dorsum impressed at mesoëpinotal suture; promesonotal suture usually distinct 22
Thoracic dorsum without any traces of suture or impressions **Pogonomyrmex**

22. Posterior tibial spurs pectinated ....**Myrmica** p. 587
Posterior tibial spurs simple 23

23. Small hypogæic species, with vestigial eyes and two keels on clypeus ....**Stenamma** p. 585
Medium-sized epigæic species with well-developed eyes and no keels on clypeus 24

24. Workers monomorphic 25
Workers polymorphic ....**Novomessor**

25. Cosmopolitan species with moderately slender thorax and legs ....**Aphænogaster** (*s. str.*) p. 585
Tropical and subtropical species with very slender thorax and legs ....**Aphænogaster (Deromyrma)**

26. Clypeus armed with a pair of ridges which project forward in the form of teeth, rarely without teeth, but then the epinotum quite unarmed; mesoëpinotal suture marked **Monomorium** p. 584
Clypeus of a different conformation, rarely 2-toothed, but then the mesoëpinotal suture indistinct 27

27. Postpetiole campanulate, not constricted behind, but applied with its whole posterior surface to first gastric segment **Macromischa**
Postpetiole constricted behind ....**Leptothorax** p. 588

Myrmecina Curtis.

M. graminicola americana var. **brevispinosa** Emery.

Rare; nesting in small colonies under stones in shady woods. Males and winged females appear during August. It is a timid species which " feigns death " when rudely handled.

Colebrook (W. M. W.).

Monomorium Mayr.

M. minimum (Buckley) Emery.

This very small jet-black ant nests in small crater nests in sandy or gravelly places. The workers move in files, visiting plants in search of honey-dew and the secretion of the extrafloral nectaries. The species seems to be absent from the hilly portions of the State.

New Haven, North Haven (H. L. V.).

°**M. pharaonsis** Linnæus.

This little " red " or " yellow house ant," though not recorded from Connecticut, can hardly be absent from the seaport towns, as it is common on ships and has been carried to all parts of the world from its original home in the warmer regions of the Old World.

Solenopsis Westwood.

S. molesta Say.

A species with minute yellow workers and much larger brown females and blackish males. It is common in open grassy places, where it may live either in independent formicaries under stones, or as a thief ant in the walls separating the galleres of the formicaries of larger ants belonging to the genera *Formica, Myrmica, Aphænogaster,* etc. The males and winged females appear late in August.

New Haven (E. B. Whitttlesey); North Haven (H. L. V.); Colebrook (W. M. W.).

Pheidole Westwood.

P. pilifera Roger.

This ant undoubtedly occurs in sandy regions in the southern portion of the State, as it is common on Long Island (Cold Spring Harbor) and has been found in Massachusetts. It is a true harvesting ant, storing the chambers of its nest with seeds of grass and other plants. The huge-headed soldiers undoubtedly function as seed-crushers.

New Haven (W. E. B.).

Crematogaster Lund.

C. lineolata Say.

A very common species, nesting under stones in open places, under stumps, boards, the bark of old logs, etc. There is a vestigial tendency in this ant to construct carton partitions or cells in its nest or over aphids and coccids on plants. The workers, which have a disagreeable odor, move about in loose files and often carry the triangular gaster over the thorax with the tip turned forward. The males and winged females may be found in the nests from the latter part of July to September.

Connecticut (Mayr); Branford, West Haven (H. L. V.); New Haven, New Canaan (W. E. B.); Suffield (Geo. Dimmock); Colebrook (W. M. W.).

C. lineolata var. **cerasi** Fitch.

Differs from the preceding in its paler color.

Colebrook (W. M. W.).

Stenamma Mayr.

S. brevicorne Mayr.

Rare; nesting in small colonies under stones or vegetable mold in rich woods.

Colebrook (W. M. W.).

Aphænogaster Mayr.

Key to Species.

1. Antennal scape with a long, flattened lobe at its base ....**treatæ**
   Antennal scape without a lobe 2
2. Basal third of first gastric segment longitudinally striated **mariæ**
   Basal third of first gastric segment smooth 3
3. Epinotal spines at least as long as base of epinotum; color red ....**tennesseensis**
   Epinotal spines shorter than base of epinotum; color reddish brown or black 4
4. Epinotal spines somewhat longer than half the base of epinotum; length 4.5-5 mm. ....(typical) **fulva**
   Epinotal spines shorter; length 4-4.5 mm. 5

5. Color reddish brown .... **fulva** subspecies aquia
Color pitchy black .... **fulva aquia** var. picea

A. tennesseensis Mayr.

This species differs from our other species of *Aphænogaster* in having very small and very smooth females with huge epinotal spines. These aberrant females probably establish their colonies in nests of *Aphænogaster fulva* or some one of its varieties in the same way that *Formica difficilis* var. *consocians* establishes its colonies in nests of *F. schaufussi* var. *incerta* (*vide* infra). At least *tennesseensis* is known to occur only in regions where fulva is unusually abundant, and several mixed colonies of the two species, containing queens of *tennesseensis* only, have been recorded. When living in unmixed colonies it always nests in rotten wood.

Colebrook (W. M. W.).

A. treatæ Forel.

The female and worker are easily recognized by the remarkable lamella on the base of the antennal scape.

Poquonock (H. L. V.), almost the northernmost locality in which this species has been found.

A. mariæ Forel.

A single winged female that had just descended from her nuptial flight was taken 8 September, 1901.

Colebrook (W. M. W.).

A. fulva Roger.

Nesting in rotten wood in rather dense forests; rarer than the following subspecies and variety.

Connecticut (Mayr); Colebrook (W. M. W.).

A. fulva aquia (Buckley) Emery.

Under stones in shady woods, often in the same stations as the following variety.

Branford (H. L. V., H. W. W.); New Haven (H. L. V.); Colebrook (W. M. W.).

A. fulva aquia var. picea Emery.

Apparently common throughout the State. The males and winged females appear during July and August.

Connecticut (Emery); Colebrook (W. M. W.).

Myrmica Latreille.

Key to Species.

1. First gastric segment with coarse, scattered punctures .... **punctiventris**
   First gastric segment without such punctures 2
2. Antennal scape not dilated to form a tooth or lobe at base, but merely curved ....**brevinodis** and varieties
   Antennal scape toothed or lobed at base .... **scabrinodis** and varieties

M. punctiventris Roger.

A rare species nesting in small colonies under stones or moss in moist shady woods. It is easily recognized by the coarse punctures on the gaster of the worker and female. The winged phases appear during August and September.

Colebrook (W. M. W.).

M. brevinodis Emery, var. **canadensis** Wheeler.

In Connecticut this form is confined to the bogs and low-lying pastures among the Litchfield Hills where it nests in grassy hummocks or under stones. It is the host of a species of *Leptothorax, L. emersoni* (see p. 588). The males and winged females appear during August.

Colebrook (W. M. W.).

M. scabrinodis Nylander, var. **sabuleti** Meinert.

This variety of the palearctic *scabrinodis* is reddish in color and in the male phase has the antennal scape somewhat more than a third the length of the funiculus. It nests in sandy or gravelly, sunny places, such as open pastures, roadsides, etc. The males and winged females may be found in the nests in the latter part of August.

West Haven, Branford (H. L. V.); New Haven (W. E. B.); Colebrook (W. M. W.).

M. scabrinodis var. **schencki** Emery.

This form sometimes passes in the literature as *lobicornis.* The male has short, thick antennal scapes, shorter than those of *sabuleti* and rarely longer than one-fourth of the funiculus.

Stafford (W. E. B.); Colebrook (W. M. W.).

M. scabrinodis var. **fracticornis** Emery.

A form which is occasionally found nesting in the grass of cool bogs or meadows, and is small and dark colored, with the antennal scape bent at a right angle.

Connecticut (Pergande, Emery).

Leptothorax Mayr.

Key to Species.

1. Thorax faintly but distinctly impressed at mesoëpinotal suture 2
   Thorax not impressed at mesoëpinotal suture 3
2. Post petiole opaque, sculptured **acervorum** subspecies **canadensis**
   Postpetiole smooth .... **emersoni**
3. Color black or dark brown; epinotal spines very long and straight .... **longispinosus**
   Color yellow; epinotal spines curved 4
4. Epinotal spines long and thin .... (typical) **curvispinosus**
   Epinotal spines short and nearly straight .... **curvispinosus** subspecies **ambiguus**

L. acervorum subspecies **canadensis** Provancher.

A rather rare boreal form nesting in bark in small colonies.

Colebrook (W. M. W.).

L. emersoni Wheeler.

Living only in xenobiosis with colonies of *Myrmica brevinodis*. It obtains its food by licking the surfaces and mouth-parts of the *Myrmica* workers, and brings up its brood in little cells which communicate by means of slender galleries with the larger chambers and runways of the *Myrmica*. The males and winged females appear during August.

Colebrook (W. M. W.).

L. longispinosus Roger.

A black species nesting under small stones lying on large boulders, in the clefts of rocks, in hollow nuts lying on the ground, and more rarely under bark. The workers seek their food, which consists of small insects and honey-dew, on the low vegetation in the shade of the trees.

Colebrook (W. M. W.).

L. curvispinosus Mayr.

Nesting in hollow twigs, galls, etc. Easily recognized by its yellow color and the two black or brown spots on the first gastric segment.

Branford, Rockville (H. L. V.).

L. curvispinosus Mayr, subspecies **ambiguus** Emery.

Very similar to the preceding but with shorter and straighter epinotal spines.

West Haven (H. L. V.); Stafford (W. E. B.); Colebrook (W. M. W.).

Tetramorium Mayr.

°T. cæspitum Linnæus.

Though this form has not yet been recorded from Connecticut, there can be little doubt that it occurs within the state. I have found it at Mamaroneck and Cold Spring Harbor, N. Y., both localities very near the Connecticut boundary. It has been introduced into America from Europe.

DOLICHODERINÆ.

Key to Genera.

1. Chitinous integument hard and brittle, often strongly sculptured; thorax and petiole often spinose or angular .... **Dolichoderus** p. 589
   Chitinous integument thin and flexible, smooth or very finely sculptured; thorax and petiole always unarmed 2
2. Scale of petiole very small, strongly inclined forward, or even altogether absent 3
   Scale of petiole more or less inclined, but well developed 4
3. Scale of petiole small but distinct; gizzard with a convex, 4-lobed calyx ....**Forelius**
   Scale vestigial or absent; gizzard with a depressed calyx, without lobes ....**Tapinoma** p. 590
4. Epinotum with a conical elevation ....**Dorymyrmex**
   Epinotum without a conical elevation 5
5. Body not conspicuously hairy or pubescent; gizzard very short with a large reflected calyx; ocelli absent ..**Iridomyrmex**
   Body densely pubescent; gizzard at least as long as broad; ocelli usually present in large workers ....**Liometopum**

Dolichoderus Lund.

D. mariæ Forel.

Readily distinguished from our other species of *Dolichoderus* by the bright red head and thorax in the worker and female. It forms large colonies, nesting in sandy places about the roots of grasses and bushes. The workers ascend trees in files and attend aphids and coccids.

Connecticut (Emery).

2. Last three joints of maxillary palpi elongated, of nearly equal length 3
Last three joints of maxillary palpi short, successively diminishing in length 4
3. Scapes and legs without erect hairs ......**niger** var. **americanus**
Scapes and legs beset with erect hairs ....**niger** var. **neoniger**
4. Tips of scapes not quite reaching to posterior corners of head ....**brevicornis**
Tips of scapes surpassing posterior corners of head........ 5
5. Tips of antennal scapes but slightly surpassing posterior corners of head; color pale yellow **flavus** subspecies **nearcticus**
Tips of antennal scapes extending some distance beyond posterior corners of head; color brownish yellow........ 6
6. Gaster subopaque; with appressed hairs ....
umbratus subspecies **mixtus** var. **aphidicola**
Gaster smooth and shining, without appressed hairs ....
umbratus mixtus var. **speculiventris**
7. Petiole low and blunt above in profile....................**latipes**
Petiole higher, thin, and acute above in profile 8
8. Penultimate joints of distally incrassated antennal funiculus somewhat broader than long; gaster with abundant long hairs ....**claviger**
Penultimate joints of but slightly incrassated antennal funiculus not broader than long; gaster with sparse long hairs ....**interjectus**

L. niger Linnæus, var. americanus Emery.

This ant, which passes in much of our entomological literature as *L. alienus*, is not only the commonest of our numerous species of *Lasius*, but the most abundant of our ants, and hence, of all our insects. It occurs over the whole of North America except the extreme southern and southwestern portions, from timberline on the highest mountains to the sands of the seashore. Even in circumscribed localities it shows in its nesting sites great adaptability to different physical conditions, from the damp rotten wood of dense forests to the sandy soil of dry, sunny roads. Usually the workers living in the latter stations are much paler in color than the woodland forms. The nests are indifferently under bark, logs or stones, in rotten wood or in soil. When in the open soil, they are surmounted by small single or clustered craters. Like all of our other species of *Lasius*, *L. niger* var. *americanus* is much given to cultivating root aphids in the chambers and galleries of its nests; but, with the exception of the variety *neoniger*, it is the only one of our forms that is not exclusively subterranean in its habits. It may often be seen visiting the foliage of trees and bushes in search of aphids and small insects. Professor S. A. Forbes has shown that it is of considerable economic importance on account of its noxious habit of cultivating the root aphids of maize, or Indian corn (*Aphis maidiradicis*). The males and winged females appear in August.

New Haven, West Haven, Branford (H. L. V.); New Haven (W. E. B., B. H. W.); Colebrook, Winsted, Norfolk (W. M. W.).

L. niger Linnæus, var. **neoniger** Emery.

Differs from the preceding variety in having erect hairs on the legs and antennal scapes in the workers and females.

New Hartford, Stafford (W. E. B.); Colebrook, Winsted, Norfolk (W. M. W.).

L. flavus nearcticus Wheeler.

The American representative of the European *flavus*, under which name it is sometimes recorded in the literature. The bodies of the workers have a milky white appearance. The colonies, which are rather small, nest under stones or leaf-mold in damp, shady woods. The males and winged females appear during the first week of August.

Connecticut (Mayr); Colebrook (W. M. W.).

L. brevicornis Emery.

The worker of this species differs from that of the preceding in having the antennal scapes not reaching beyond the posterior corners of the head. The colonies nest under stones on hill slopes and in pastures where the soil is rather dry and sandy. The males and winged females appear about the middle of August.

Branford (H. W. W.); Colebrook (W. M. W.).

L. umbratus mixtus Nylander, var. **aphidicola** Walsh.

Nesting under stones or in old logs and stumps in damp, shady woods. The colonies, which are rather populous, cultivate snow-white root aphids and coccids in great numbers, especially during the winter and early spring. The males and females appear during August and early September.

Westport (W. E. B.); Colebrook, (W. M. W.).

L. umbratus mixtus var. **speculiventris** Emery.

This form, originally described as a distinct species, is scarcely more than a variety. Its habits, according to my observations, are very similar to those of *aphidicola.*

Colebrook (W. M. W.).

Subgenus Acanthomyops Mayr.

L. (A.) interjectus Mayr.

The yellow *Lasii* of the subgenus *Acanthomyops,* besides having only 3- instead of 6-jointed maxillary palpi in the worker and female phases, have a peculiar and rather agreeable odor like lemon verbena, and quite unlike the odor of the typical *Lasii.* They all form large colonies and lead a subterranean aphidicolous existence. *L. interjectus* is the largest species of the genus. It is found nesting in old logs and stumps in open woods and occasionally makes rough mounds or merely excavates its galleries under large stones.

Connecticut (Mayr); Colebrook (W. M. W.).

L. (A.) claviger Roger.

The commonest of our species of *Acanthomyops,* nesting under stones along the edges of woods where there is plenty of warmth and moisture. The males and winged females may be found in the nests from the middle of August till the latter part of September.

Connecticut (Mayr); Colebrook (W. M. W.).

L. (A.) latipes Walsh.

Rather common in grassy fields under stones. It has been shown by Mr. J. F. McClendon and myself that some colonies of this ant have dimorphic females. One of these females (the β-female) is very hairy, and has much flattened femora and tibiæ. The other female (the α-female) is intermediate in structure between the β-female and the female of *claviger.* The males and winged females are found in the nest during the latter part of August.

Colebrook (W. M. W., J. F. McClendon).

Formica Latreille.

Key to Species.

1. Clypeus with a notch in middle of anterior border (*F. sanguinea*) 2
   Clypeus without a notch in its anterior border 4

2. Color deep red, gaster black 3
Color light red, gaster brown .... **sanguinea** subspecies **subintegra**

3. Head and thorax not infuscated; slaves nearly always present in formicaries ....**sanguinea** subspecies **rubicunda**
Head and thorax often infuscated above; slaves few or entirely absent ....**sanguinea** subspecies **aserva**

4. Posterior border of head broadly excised ....**exsectoides**
Posterior border of head not excised 5

5. Body rather stout; head of larger workers usually but little longer than broad; second to third funicular joints, much more elongated than sixth to eighth; color red, with brown or black gaster 6
Body more slender and graceful; head of larger workers distinctly longer than broad; second to third funicular joints but little more elongated than sixth to eighth; color rarely as in preceding 9

6. Petiole broad, with sharp upper border 7
Petiole narrow, thick and blunt above....**difficilis** var. **consocians**

7. Gula, or lower surface of head, with erect hairs 8
Gula and body without erect hairs ..**truncicola** subspecies **integra**

8. Tibiæ with suberect hairs; females large .... **truncicola** subspecies **obscuriventris**
Tibiæ without suberect hairs; females very small ....**nepticula**

9. Middle funicular joints more than one and one-half times as long as broad; scape very slender and nearly straight; petiole with convex anterior and posterior surfaces and blunt upper margin; body smooth and rather shining (**pallide-fulva**)...................................... 10
Middle funicular joints usually less than one and one-half times as long as broad; scape distinctly curved at base; posterior surface of petiole flat, body more densely pubescent (**fusca**) 13

10. Gula and petiolar border with erect hairs 11
Gula and petiolar border without erect hairs 12

11. Yellowish or reddish brown, gaster but little darker, gula and petiolar hairs numerous .... **pallide-fulva** subspecies **schaufussi**
Somewhat smaller and darker, with only a few erect hairs on gula and petiolar border **pallide-fulva schaufussi** var. **incerta**

12. Head and thorax deep reddish; gaster brownish black, shining ....**pallide-fulva** subspecies **nitidiventris**
Head and thorax as well as gaster dark brown or piceous, surface more opaque ......**pallide-fulva nitidiventris** var. **fuscata**

13. Gula without erect hairs 14
Gula with erect hairs 15

14. Gaster finely and densely pubescent, with gray, silky luster **fusca var. subsericea**
Gaster scarcely pubescent, finely shagreened, shining with a submetallic luster ....**fusca var. subænescens**
15. Color light brown, with darker head and gaster ....**subpolita**
Color black or dark brown, with reddish legs ....**neogagates**

F. sanguinea rubicunda Emery.

This subspecies of the holarctic "blood-red slave-maker," or sanguinary ant, is less common than the next. It usually nests under stones in grassy places along the edges of woods. It obtains slaves, or auxiliary workers, by kidnapping the larvæ and pupæ of *subsericea*. The males and winged females appear during July and August.

New Haven (B. H. W.); Colebrook (W. M. W.).

F. sanquinea subintegra Emery.

This variety has the same auxiliary species as the preceding, and the somewhat smaller males and winged females make their appearance during the same months.

New Haven (H. L. V.); Colebrook (W. M. W.).

F. sanguinea aserva (Forel).

Rarer than the preceding form of *sanguinea*. The slaves, which are present in the colonies only in very small numbers or are altogether absent, belong to *subsericea*.

Colebrook (W. M. W.).

F. exsectoides Forel.

This "mound-building ant of the Alleghanies," as McCook has named it, is found nesting in open glades or clearings and is not uncommon in the more hilly portions of the State. The mounds which it constructs of earth and vegetable débris, are regularly dome-shaped and usually vary from three to four feet in diameter at the base and from one to two feet in height. They are exposed to the sun, though often covered with living grass except at the summit. (See plate v.) . The entrances are very numerous and mostly confined to a broad girdle around the base. A single colony often extends over several mounds. The workers, which are easily distinguished from those of our other species of *Formica* by the excised posterior border of the head, are very pugnacious. Like the European *exsecta*, they have a habit of sawing off the heads of other ants. It is known that the females establish their colonies in depauperate colonies of *fusca* var. *subsericea*.

Connecticut (Mayr); Branford, North Haven, New Haven (H. L. V.); New Hartford, Stafford (W. E. B.); Cromwell, Hartford (Forel); Colebrook (W. M. W.).

F. truncicola obscuriventris Mayr.

A single colony, found near the summit of one of the Litchfield Hills (about 1,400 feet).

Connecticut (Mayr); Colebrook (W. M. W.); Brookfield (E. L. Dickerson).

F. truncicola integra Nylander.

Our largest and most conspicuous form of *truncicola* nesting in great colonies which often comprise several nests. These are in piles of large stones or in old logs and stumps. The ants stuff all the crannies of their abodes with bits of dead grass, leaves, etc. Like most other species of *Formica*, *integra* is much given to attending aphids. It is most abundant in hilly regions, where it prefers sunny glades or clearings in the forests. The males and winged females appear in July.

Connecticut (Mayr); Colebrook (W. M. W.).

F. difficilis Emery, var. **consocians** Wheeler.

In this interesting species, as I have shown, the females, which are yellow and hardly larger than the largest workers, are temporary parasites in the nests of *schaufussi* var. *incerta*. Soon after fertilization the queen seeks adoption in some depauperate and probably queenless colony of *incerta* and there permits her hosts to bring up her young. Later the *incerta* workers die off, leaving the *consocians* as a pure and independent colony, which grows rapidly in size and shows no evidence of its parasitic origin. The nesting habits of *difficilis* resemble those of *integra* on a small scale.

Colebrook (W. M. W.).

F. nepticula Wheeler.

Like the preceding, this species has very small females, which, in all probability, are social parasites in the colonies of some other *Formica*, probably *neogagates* Emery. The males and winged females make their appearance during July.

Colebrook (W. M. W.).

F. pallide-fulva schaufussi Mayr.

This is one of the commonest species of *Formica.* It nests in rather small colonies under stones or in small, obscure mound nests in sunny and grassy fields. It is timid and runs rapidly. Its food seems to consist very largely of the excrement of aphids and the carcasses of insects.

Connecticut (Mayr and Emery); New Haven (W. E. B.); Winsted, Norfolk, Colebrook (W. M. W.).

F. pallide-fulva schaufussi var. **incerta** Emery.

Common in the same localities as the typical *schaufussi,* from which it differs merely in somewhat darker coloration and in having fewer hairs on the chin and petiolar border. It is the host of *difficilis* var. *consocians.*

Branford (H. W. W.); Rockville (H. L. V.); Winsted, Norfolk, Colebrook (W. M. W.).

F. pallide-fulva nitidiventris Emery.

The workers are smaller than those of the two preceding forms, dark colored, without hairs on the chin and petiolar border, and with more shining and less pubescent gaster. The habits are similar to those of other forms of the species.

New Haven (P. L. B.); Salisbury, New Haven, Orange (W. E. B.); Colebrook (W. M. W.).

°**F. pallide-fulva nitidiventris** var. **fuscata** Emery.

This variety, which is characterized by its dark color and somewhat opaque gaster, can hardly be absent from Connecticut, as it occurs in the adjacent states.

F. fusca Linnæus, var. **subsericea** Say. Silky Ant.

Next to *Lasius niger* var. *americanus,* this is the commonest of our ants and hence also of our insects. It prefers sunny, grassy places, and either constructs dome-shaped mounds which are largest and most definite in outline in the Middle States, or excavates its galleries under stones, boards, the bark of stumps, etc. Except when living in large colonies, it is a very cowardly species. Like the other members of the genus *Formica,* it attends aphids, but is equally fond of feeding on the dead bodies of insects. The males and winged females make their appearance during July and August.

Suffield (Dimmock); Branford, Cheshire, Mt. Carmel, New Haven (H. L. V.); New Haven, Salisbury (W. E. B.); Cromwell, Hartford (Forel); Winsted, Norfolk, Colebrook (W. M. W.).

F. fusca var. subaenescens Emery.

A rare species, apparently, in New York and New England, but common in the Northern Middle States (Illinois, Wisconsin, Michigan). It differs from the preceding variety in having a more metallic and less pubescent surface. It prefers to nest under logs and stones in rather shady woods.

Connecticut (Emery); Colebrook (W. M. W.).

°**F. subpolita** Mayr.

I have not seen specimens of the typical form of this species from the State. It is possible that Mayr's specimens may have belonged to the following species.

Connecticut (Mayr).

F. neogagates Emery.

Nesting in rather small colonies under stones only on the hills at an altitude of about 1,000 feet or more, according to my observations. The males and winged females appear during late July and early August.

Kent, Salisbury (W. E. B.); Norfolk, Colebrook (W. M. W.).

Polyergus Latreille.

P. lucidus Mayr.

This rare and beautiful species, the "shining slave-maker" of McCook, or "shining amazon," as it may be called, uses the workers of *Formica schaufussi* as slaves, or auxiliaries. These are bred from pupæ kidnapped from their maternal nests by the warlike *lucidus* workers. The latter are quite unable to feed themselves, excavate their nests, or care for their own brood, but have to depend for these important activities on the *schaufussi* workers. Hence the ants of this species are quite unable to live an independent life and may be regarded as permanently parasitic on fragments of *schaufussi* colonies which they bring together with great skill. The sexual forms make their appearance during August.

Connecticut (Mayr).

Camponotus Mayr.

Key to Species.

1. Clypeus with a distinct notch or impression in the middle of its anterior border ....**fallax** and its varieties
Clypeus without such a notch or impression................ 2
2. Head of worker major smooth and shining behind; color, at least in part, light red or yellow (**castaneus**) 3
Head of worker major opaque or feebly shining behind; color black, or black and dark red (**herculeanus**) 4
3. Yellow or light red; gaster slightly darker (typical) **castaneus**
Head black or dark brown ..... **castaneus** subspecies **americanus**
4. Gaster opaque, with long, appressed pubescence 5
Gaster shining, with short, sparse pubescence; thorax deep red ....**herculeanus** subspecies **ligniperda** var. **noveboracensis**
5. Deep black throughout ...**herculeanus** subspecies **pennsylvanicus**
Legs, posterior portion of thorax, petiole, and base of gaster brownish red .....**herculeanus pennsylvanicus** var. **ferrugineus**

C. fallax Nylander, var. **nearcticus** Emery.

Till recently this species has been cited in the literature as *C. marginatus* Latreille. Our American subspecies and varieties nest in the hollow twigs of trees and bushes and attend aphids.

Connecticut (Mayr); Colebrook (W. M. W.).

C. castaneus Latreille.

The typical form of this species is probably confined to the lower, warmer, and southernmost portions of the State, as I have seen no trace of it in the Litchfield Hills. It nests under stones and logs in rather small colonies.

Connecticut (Mayr, Coe); Westville (W. E. B.).

C. castaneus americanus Mayr.

Brookfield (E. L. Dickerson).

C. herculeanus pennsylvanicus Degeer. Carpenter Ant.

The common "carpenter ant," entirely black in color. It nests usually in shady woods in old logs and stumps, whence it may migrate into old farm-houses and suburban residences, and become a pest, both by riddling the wood-work with its large anastomosing galleries and by visiting the pantries and kitchens for sweets.

Connecticut (Mayr); Woodmont (P. L. B.); New Haven, Branford (H. L. V.); Colebrook (W. M. W.).

C. herculeanus pennsylvanicus var. **ferrugineus** Fabricius.

A beautiful color-variety of *pennsylvanicus,* with the legs, inferior and posterior portions of the thorax, petiole, and base of gaster rust-red in the female and worker phases. Its habits are very similar to those of the typical form, but it seems to be less abundant and more local in its distribution. I have been unable to find it in the Litchfield Hills.

New Haven (E. J. S. M., H. L. V.); Orange, New Canaan (W. E. B.).

C. herculeanus ligniperda var. **noveboracensis** Fitch.

Nesting in old stumps and logs like the preceding, from which it differs in having a smoother surface and an entirely red thorax in the worker phases.

New Hartford, Orange (W. E. B.); Colebrook (W. M. W.).

CHRYSIDOIDEA.

CHRYSIDIDÆ.

The cuckoo wasps or gold wasps. These most beautiful of all the wasps in the state are guests or parasites in the nests of bees and wasps.

Key to Genera.

1. Tongue not longer than thorax 2
   Tongue longer than thorax, bee-like ....**Parnopes** p. 605
2. Third abdominal segment without submarginal grooves or pits 3
   Third abdominal segment with submarginal grooves or pits; head as broad or broader than postscutellum .... **Chrysis** p. 604
3. Tarsal claw with 2 to 6 teeth besides apical tooth 4
   Tarsal claw different 5
4. Apical abdominal segment not produced as if pinched; apical margin of third abdominal segment notched, rounded .... **Omalus** p. 602
   Apical abdominal segment produced as if pinched; apical margin of third abdominal segment emarginate, the emargination filled or partly filled with a membrane **Notozus** p. 603
5. One small perpendicular tooth in middle of tarsal claw **Hedychridium** p. 603
   Tarsal claws cleft ....**Hedychrum** p. 603

Omalus Jurine.

Key to Species.

Two teeth within tarsal claw ....**iridescens**
Three to six teeth within tarsal claw, notch much wider than deep ....**corruscans**
Notch as broad as deep ....**sinuosus**

***O. iridescens** Norton.

Length 3-5 mm.; margin of the third abdominal segment semi-transparent yellowish.

O. corruscans Norton.

Length 6.5 mm. Parasitic upon the wasp *Diodontus americanus,* and another wasp, *Stigmus americanus.*

O. sinuosus Say.

Length 3-4 mm.

Thompson, 11 July, 1905 (H. L. V.).

Notozus Foerster.

Key to Species.

Snout-like projection of abdomen not projecting distinctly beyond line of margins of third segment ....**viridicyaneus**

Snout-like projection of abdomen distinctly projecting beyond line of margins of third segment ....**marginatus**

°**N. viridicyaneus** Norton.

Length 5-6 mm.

N. marginatus Patton.

Length 3-5 mm.

Thompson, 11 July, 1905 (H. L. V.).

Hedychridium Perrin.

But one species is known from the state.

H. dimidiatum Say.

A triangular area below the postscutellum; pro- and mesothorax with close equal punctures.

Branford, 4 July, 1905 (H. W. W.); Rockville, 23 August, 1905 (H. L. V.).

Hedychrum Latreille.

Key to Species.

Head and thorax above with smoothed areas and sparse punctures ....**obsoletum**

Head and thorax above with no smooth areas; blue and purple to emerald-green ....**violaceum**

H. obsoletum Say.

Length 5.5 mm.

New Haven, 13 June, 1902 (E. J. S. M.), 6 July, 1904 (P. L. B).

H. violaceum Brullé.

Length 7.5 mm.

Scotland, 10 August, 1905 (B. H. W.).

Chrysis Linnæus.

Key to Species.

1. Apical margin of abdomen entire; abdomen green, blue, and purple, like thorax 2
Apical margin of abdomen not entire 5
2. Posterior corners of margin of third segment rounded, even, not produced 3
Posterior corners of margin of third segment angulated, produced; small series of submarginal pits at apex of abdomen ....**cobaltina**
3. An arched keel across face above basin ....**verticalis**
No arched keel across face above basin 4
4. Submarginal series of pits at apex of abdomen at bottom of a strong declivity ....**pacifica**
Submarginal series of pits at apex of abdomen in a broad shallow groove ....**hilaris**
5. Apical margin of abdomen with one notch; abdomen blue or green like thorax ....**perpulchra**
Apical margin of abdomen with two or more notches 6
6. Apical margin of abdomen with two notches—three teeth.. 7
Apical margin of abdomen with three notches—four teeth 8
7. Postscutellum rounded behind, not produced ....**doriæ**
Postscutellum conical behind, produced ....**parvula**
8. Lateral margin of third abdominal segment, seen from side, bisinuate; basin of face striate ....**frey-gessneri**
Lateral margin of third abdominal segment, seen from side, not bisinuate 9
9. Lateral margin of third abdominal segment, seen from side, straight or arched inwardly 10
Lateral margin of third abdominal segment, seen from side, arcuate or sinuate just before outer apical teeth .....**nortoni**
10. Median teeth farther from each other than from outer teeth **nitidula**
Median teeth not farther from each other than from outer teeth ....**cærulans**

C. (Chrysogona) verticalis Patton.

Length 4-6 mm.

C. (Olochrysis) pacifica Say.

Length 6-12 mm.

C. (O.) hilaris Dahlbom.

Length 6 mm.

°**C. (O.) cobaltina** Aaron.

Length 9 mm.

°C. **(Gonochrysis) perpulchra** Cresson.

Length 6-8 mm.

°C. **(Trichrysis) doriæ** Gribodo.

Length 4.5 mm.

C. **(T.) parvula** Fabricius. Howard, Insect Book, Pl. i, Fig. 12.

Length 7-11 mm.

°C. **(Tetrachrysis) frey-gessneri** Gribodo.

Length 7-8.5 mm.

C. **(T.) nitidula** Fabricius.

"Frontal carina strong; third joint more than one-half again as long as fourth; notauli strongly curved outwardly anteriorly." (S. A. Rohwer.)

Scotland, 25 July, 1904 (B. H. W.); Pemaquid Point, Me., 2 September, 1909 (H. W. Foote).

C. **(T.) cærulans** Fabricius.

New Haven, 17 June, 1902 (E. J. S. M.); Colebrook, 21 July, 1905 (H. L. V.).

C. **(T.) nortoni** Aaron.

Length 6-9 mm.

Parnopes Fabricius.

But one species is likely to occur in the state.

°**P. aglaspidula** Melander and Brues.

Postscutellum emarginate; antennæ in greater part black; legs metallic; tegulæ green. Length 10 mm.

VESPOIDEA.

By SIEVERT ALLEN ROHWER.*

The superfamily Vespoidea is composed of a number of distinct types of predaceous and solitary wasps. There is so much variation in the structure and in the habits of the species that it is very likely that, when a complete and entirely satisfactory classification of these insects has been made, the present superfamily Vespoidea will be divided into a number of superfamilies. In fact this has already been suggested by Mr. Banks when he proposed the superfamily Scolioidea.

The group of Diploptera, including the families Eumenidæ and Vespidæ of the present paper, is composed of closely related, easily recognized forms. The habits of the more specialized members of this group resemble those of the bees, and in this group we have three well defined forms or sexes, that is the males, females and workers.

It is difficult to say whether this superfamily, as a whole, is beneficial or injurious; as some of the large groups such as the Mutillidæ and Sapygidæ are parasitic within the nests of bees and would have to be considered as injurious; while such groups as the Bethylidæ, Dryinidæ, Scoliidæ and Psammocharidæ are all beneficial insects, as they are either parasitic on Homoptera or white grubs, or provision their nests with spiders. The Diplopterous insects are, in the main, beneficial as they destroy very many Lepidopterous larvæ, although specimens are often found flying around fruit and are often very annoying.

The following table of the families will serve to distinguish all the North American insects belonging to these families but will not apply in one or two cases to certain exotic genera or species.

Key to Families.

1. Posterior angle of pronotum sharp and above tegula; wings folded longitudinally in repose 2

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*The families Bethylidæ and Dryinidæ are by Charles T. Brues, as indicated at the beginning of each of these families. The Ceropalinæ and Eumenidæ are by Henry L. Viereck.

Posterior angle of pronotum rounded or rather sharp but always in front of or below tegula; wings not folded longitudinally in repose 3

2. Claws dentate; two forms, males and females .... EUMENIDÆ p. 634

Claws simple; three forms, females, males, workers ...... VESPIDÆ p. 640

3. No constriction between first and second abdominal segments; discoidal cells obsolete, or if the first is present it is petiolate 4

A constriction between first and second abdominal segments which is usually deep; at least first discoidal cell well defined, not petiolate 5

4. Head oblong; antennæ with twelve or more joints; stigma lanceolate; fore tarsi of female never chelate .... BETHYLIDÆ p. 608

Head transverse, subquadrate or globose; antennæ 10-jointed; stigma large; fore tarsi of female chelate ...... DRYINIDÆ p. 613

5. Legs very long, posterior femora when directed backward extending beyond middle of abdomen; mesepisternum with a dividing cephalocaudal suture..PSAMMOCHARIDÆ p. 625

Legs of usual length, posterior femora when directed backward not reaching to middle of abdomen; mesepisternum without a dividing cephalocaudal suture ....

6. Sternellum large, sharply defined, extending between intermediate coxæ so they are well separated; females winged; tibiæ usually flattened with bristles exteriorly .... SCOLIIDÆ p. 616

Sternellum not defined; intermediate coxæ contiguous; or, if coxæ are somewhat separated, readily distinguished from the preceding family by not having sternellum separated from eusternum by a transverse suture; tibiæ not flattened and without a single rugose area; if rugose, nearly uniformly so 7

7. Clypeus with length and width subequal or nearly so; female winged; apex of abdomen in male without appendages; eyes deeply emarginate ....SAPYGIDÆ p. 620

Clypeus transverse, very much wider than long; apex of the abdomen in male armed or unarmed; eyes usually entire 8

8. Female thorax divided into three parts; apex of abdomen in male armed with a single spine ....METHOCIDÆ p. 620

Female thorax divided into two parts, prothorax being well separated; apex of abdomen in male without spines .... MYRMOSIDÆ p. 621

Female thorax undivided; apex of abdomen in male with two spines ....MUTILLIDÆ p. 621

BETHYLIDÆ.

By Charles Thomas Brues.

Key to Genera.

1. Wings fully developed 2

Wings absent or reduced in size 14

2. Anterior wings with a closed small discoidal cell .... **Parasierola** p. 612

Anterior wings without any closed discoidal cell 3

3. Radius well developed; one, two, or three closed basal cells 4

Radius not developed; median and submedian cells open.. **Neoscleroderma** p. 610

4. Wings with an accessory thickening before stigma (parastigma) 5

Wings without parastigma 7

5. Antennæ 13-jointed .... **Goniozus** p. 612

Antennæ 12-jointed 6

6. Eyes pubescent; median and submedian cells of equal length **Plastanoxus** p. 611

Eyes bare; median cell longer than submedian .... **Progoniozus** p. 612

7. Metathorax not margined behind 8

Metathorax margined behind 10

8. Scutellum without foveæ or an impressed groove at its base **Apenesia** p. 610

Scutellum with a broad transverse groove at its base....... 9

9. Pronotum with a transverse groove before posterior margin; tarsal claws tridentate .... **Pristocera** p. 609

Pronotum without such groove; tarsal claws simple or bidentate .... **Pseudisobrachium** p. 609

10. Radius much longer than basal vein, forming a cell which is open at apex 11

Radius very short, never longer than basal vein 13

11. Base of scutellum with two foveæ, sometimes united by a narrow impressed line .... **Epyris** p. 611

Base of scutellum with a broad transverse groove across its base 12

12. Mesonotum without parapsidal furrows .... **Holepyris** p. 611

Mesonotum with two parapsidal furrows .... **Rhabdepyris** p. 612

13. Antennæ 12-jointed .... **Paralælius** p. 610

Antennæ 13-jointed .... **Lælius** p. 610

14. Metathorax flattened, with one or several longitudinal carinæ 15

Metathorax without any median carina 17

15. Base of scutellum with two foveæ, parapsidal furrows present **Epyris** p. 611

Base of scutellum with a transverse groove; no parapsidal furrows 16
16. Metathorax with one longitudinal carina..**Neoscleroderma** p. 610
Metathorax with three longitudinal carinæ ....**Holepyris** p. 611
17. Metathorax extending anteriorly between lobes of mesothorax as far as their middle 18
Methathorax inserted behind mesothorax, between lobes of which it does not extend forward..**Pseudisobrachium** p. 609
18. Metathorax feebly contracted near middle, its base as wide as its apex ....**Apenesia** p. 610
Metathorax contracted at or near base ....**Pristocera** p. 609

Pristocera Klug.

Only a single species occurs within the state.

P. armifera Say.

Male black, shining, coarsely punctate; wings fusco-hyaline; abdomen short, ovate, shining. Female ant-like, reddish brown, the abdomen paler. Length: male, 7-8 mm.; female, 4 mm.

Kent, 31 August, 1904 (W. E. B.); Rockville, 25 August, 1904 (H. L. V.).

Pseudisobrachium Kieffer.

The slender legs, absence of malar space and 4-jointed labial palpi distinguish the males from *Epyris*, and the strangulated thorax makes the females readily recognizable.

Key to Species.

Males.

1. Wings tinged with fuscous 2
Wings hyaline ....**rufiventre**
2. Mandibles with small teeth within ....**myrmecophilum**
Mandibles large and broad, without teeth within ...**mandibulare**

Females.

1. Abdomen not longer than thorax ....**myrmecophilum**
Abdomen much longer than head and thorax united 2
2. Antennæ nearly twice the length of head ....**mandibulare**
Antennæ only one and one-half times the length of head .... **rufiventre**

°**P. rufiventre** Ashmead.

Male: head and thorax black, shining, abdomen rufous; legs, including coxæ, pale; antennæ reddish. Female: head blackish; thorax brown; legs, antennæ, and abdomen brownish yellow. Length 3.5-4 mm.

°**P. myrmecophilum** Ashmead.

Male: black, punctate; mandibles rufous, antennæ and legs pale brownish yellow; abdomen piceous, paler at the sutures. Female: head piceous; thorax lighter; legs brownish yellow; abdomen piceous. Lives in ant nests. Length 3-3.5 mm.

°**P. mandibulare** Ashmead.

Male: like preceding, but the mandibles have only one large and one small tooth. Female: like *rufiventre*, but the antennæ are fully twice the length of the head instead of one and one-half times. Lives in ant nests. Length 3.5 mm.

Neoscleroderma Kieffer.

°**N. tarsalis** Ashmead.

Black, polished, impunctate; antennæ dark brown, legs piceous to black with the articulations somewhat reddish and the tarsi honey-yellow. Parasitic on the beetle *Silvanus surinamensis*, which is a common pest of various food products. Length: female, 1.8 mm.; male, 1.5 mm.

Apenesia Westwood.

°**A. coronata** Ashmead.

Black, shining, alutaceous; metathorax with a median carina; wings hyaline, the veins pale brownish; legs black, tips of tibiæ and tarsi, pale; abdomen as long as the thorax. Male: length 3 mm.

Parasitic on the common cucujid beetle *Catogenus rufus*.

Lælius Ashmead.

L. tricarinatus Ashmead.

Black; legs, except coxæ, and antennæ brownish yellow. Antennæ twice as long as the head; scutellum with a transverse furrow; metathorax with three carinæ on the disc; wings hyaline, veins pale yellowish, marginal and stigmal veins obsolete. Length 2.5-2.9 mm.

New Haven, 26 July, 1905 (H. L. V.).

Paralælius Kieffer.

Bethylus Auctorum, not Latreille.

Key to Species.

Legs honey-yellow ....**pedatus**

Legs black, tibiæ and tarsi brownish ....**centratus**

P. pedatus Say.

Female: polished black; antennæ one and one-half times the length of the head, flagellar joints quadrate; mesonotum without furrows; wings hyaline, venation yellowish. Antennæ of male three times the length of the head. Length 2.5 mm.

New Haven, 10 February, 1904.

Epyris Westwood.

Head oblong, about as long as wide, maxilla bilobed, mesonotum with furrows. Abdomen ovate. Legs stout, femora much swollen.

Key to Species.

Scutellum with two foveæ at base	**bifoveolatus**
Scutellum with a transverse line at base	**rufipes**

E. rufipes Say.

Body without trace of metallic lustre, black; metathorax with from six to eight longitudinal carinæ, mesopleuræ foveated; mandibles 5-dentate; wings sub-hyaline. Length 4 mm.

Kent, 31 August, 1904 (W. E. B.).

°**E. bifoveolatus** Ashmead.

Black, shining; coxæ and legs brownish yellow; metathorax with seven raised lines, the lateral ones abbreviated; tegulæ yellow; wings sub-hyaline, the venation yellow. Length 3.5-6 mm.

Plastanoxus Kieffer.

°**P. chittendeni** Ashmead.

Black, smooth and shining; the legs piceous black, with white tarsi; scutellum with an impressed line at base, metathorax punctulate above; wings hyaline, the venation pale. Parasitic on the beetle *Cis fuscipes*. Length 1.5 mm.

Holepyris Kieffer.

°**H. subapterus** Melander and Brues.

Brownish black; antennæ and legs brown; wings short, not reaching to base of abdomen; metathorax with three median carinæ and a lateral one, transversely wrinkled. Length 3 mm.

Rhabdepyris Kieffer.

R. occidentalis Ashmead.

Legs rufous, femora more or less fuscous; wings sub-hyaline; body aeneous black; the metathorax with five longitudinal carinæ with transverse lines between. Length 4-5 mm.

Willimantic, 4 August, 1905 (H. L. V.).

Progoniozus Kieffer.

Key to Species.

Wingless in female sex .... prolongatus
Winged in both sexes .... minimus

°**P. minimus** Ashmead.

Shining black; legs brown, the tarsi and anterior tibiæ honey-yellow; mandibles black, antennæ honey-yellow; wings hyaline, venation pale, stigmas brown. Length 1.8-2 mm.

°**P. prolongatus** Provancher.

Shining black, head very large; legs black, trochanters, tibiæ, and tarsi honey-yellow; wings aborted, not extending to the tip of the metathorax. Parasitic on *Crambus caliginosellus*. Length 4.2 mm.

Parasierola Cameron.

P. cellularis Say.

Black, shining; the antennæ varying from honey-yellow to fuscous; legs piceous, lighter apically; wings of male clear hyaline, of female slightly infuscated. Length 2-3 mm.

Milford, 17 August 1905 (H. L. V.).

Goniozus Foerster.

An undescribed species of this genus is parasitic upon the codling-moth in Kansas, and is shown in Howard's Insect Book, Fig. 19, page 36.

Key to Species.

1. Stigma and parastigma brown 2
   Stigma and parastigma black .... foveolatus
2. Stigma twice as long as wide .... platynotæ
   Stigma two and one-half times as long as wide.... columbianus

°**G. platynotæ** Ashmead.

Shining black; the mandibles, antennæ, and legs pale honey-yellow, the femora darker; metathorax smooth, with delicate median and lateral carinæ. Parasitic on *Platynota sentana*. Length 3 mm.

°**G. foveolatus** Ashmead.

Shining black, delicately punctate; antennæ honey-yellow; legs piceous, paler at tips; wings sub-hyaline, stigma and parastigma black. Length 2.5-3 mm.

°**G. columbianus** Ashmead.

Shining black, the head very feebly microscopically punctate; antennæ yellow except at base; wings hyaline, stigmas brown and veins pale yellow; legs brown, paler toward tips. Length 1.5-2 mm.

DRYINIDÆ.

By Charles Thomas Brues.

Key to Genera.

1. **Males** 2
    Females 4
2. **Front wings with an oval or ovate stigma** 3
    Front wings with a narrow or lanceolate stigma, occiput deeply concave .... **Gonatopus** p. 614
3. **Pronotum much shorter than mesonotum, the latter without furrows** .... **Anteon** p. 616
    Pronotum longer than mesonotum, the latter with furrows **Chelogynus** p. 615
4. **Wingless, ant-like, without scutellum** .... **Gonatopus** p. 614
    With wings and scutellum 5
5. **Vertex convex, not impressed** 6
    Vertex deeply impressed or concave, winged, with a scutellum .... **Dryinus** p. 614
6. **Pronotum not or scarcely visible from above, more or less hidden by front margin of mesonotum, which is strongly developed, furrows on the latter distinct, maxillary palpi 5-jointed** .... **Aphelopus** p. 615
    Pronotum almost as long as mesonotum, fourth joint of front tarsi much longer than third, first not or scarcely longer than three following united; maxillary palpi 5-jointed .... **Chelogynus** p. 615
    Pronotum much shorter than mesonotum, fourth joint of front tarsi scarcely longer than third, first not longer than three following united; maxillary palpi 4-jointed ...... **Anteon** p. 616

Gonatopus Ljungh.

Females wingless, ant-like, the thorax strongly strangulated; legs long, the femora very stout; front concave on the vertex. Males winged, thorax of the usual form.

Key to Species.

1.	Head entirely black	2
	Head in part yellowish (females)	3
2.	Females	**decipiens**
	Males	**typhlocybæ**
3.	Head less than twice as broad as long	**contortulus**
	Head twice as broad as long	**flavifrons**

***G. contortulus** Patton.

Black; occiput, face, and two basal joints of antennæ yellow, rest of antennæ fuscous; legs brownish, testaceous. Length 3-4 mm.

Type locality; Waterbury.

°**G. flavifrons** Ashmead.

Female: shining black; occiput, face, and antennæ, except the three terminal joints, yellow; legs yellow; anterior coxæ with black spots beneath and femora more or less black basally. Length 4.4 mm.

°**G. decipiens** Provancher.

Female: black; the antennæ and legs in part testaceous; thorax shining, polished. Length 2.4 mm.

°**G. typhlocybæ** Ashmead.

Male: black, opaque, shagreened, covered with a sparse whitish pubescence; antennæ and legs brown, except the anterior tibiæ and all tarsi, which are yellowish. Parasitic on *Ormenis septentrionalis.*

Dryinus Latreille.

Key to Species.

1.	Body brownish yellow	**bifasciatus**
	Body partly black	2
2.	Legs black, except femora below, knees and tarsi	**nigrellus**
	Legs yellow or rufous, except mid and hind tibiæ	**ormenidis**

°**D. bifasciatus** Say.

Honey-yellow; body varied with blackish; wings bifasciate. Length 5.5 mm.

°**D. nigrellus** Brues.

Black, except base and tip of antennæ; femora below, knees and tarsi rufous or yellow; marginal cell incomplete; palpi black; wings bifasciate. Length 4.25 mm.

°**D. ormenidis** Ashmead.

Black; legs, except mid and hind tibiæ, which are black, rufous; marginal cell complete, palpi pale; wings bifasciate. Length 4-4.5 mm. Parasitic on *Ormenis pruinosa* and *O. septentrionalis.*

Chelogynus Haliday.

Key to Species.

1.	Thorax reddish	**atriceps**
	Body entirely black	2
2.	Legs pale rufous	3
	Femora black, except tips of anterior pair	**grandis**
3.	Clypeus pale or rufous	**henshawi**
	Clypeus black	**canadensis**

°**C. atriceps** Brues.

Thorax reddish; head and abdomen black; mandibles 4-dentate; metathorax coarsely reticulate; legs rufous, the tarsi lighter; wings with two fuscous bands. Length 3.5-5 mm.

°**C. grandis** Brues.

Black; the legs in part yellow (fore and mid tibiæ and all tarsi); mandibles 4-dentate; metathorax finely rugulose; wings with two fuscous bands. Length 7 mm.

°**C. henshawi** Ashmead.

Black; antennae, legs, and clypeus pale rufous; mandibles 4-dentate; metathorax coarsely rugose; wings with two fuscous bands. Length 4.5-5 mm.

°**C. canadensis** Ashmead.

Black; the mandibles and palpi white; legs pale rufous, the pincers of the anterior tarsi very small. Length 2.5 mm.

Aphelopus Dalman.

A. americanus Ashmead.

Black; legs honey-yellow. Length 1.5 mm.

Waterbury, 29 July, 1884.

Anteon Jurine.

Only a single species of this somewhat extensive genus occurs in this region.

°**A. tibialis** Say.

Black; antennæ brown, more yellow at base; tips of femora, tibiæ, and tarsi honey-yellow; wings hyaline. Length 3 mm.

SCOLIIDÆ.

The species belonging to this family are parasitic on white grubs and often aid in the control of these insect pests.

These insects have a deep constriction between the first and second sternites. The key following will not cover forms found outside of America.

Key to Subfamilies.

1. Eyes with inner margins emarginate (marked with yellow) 2
Eyes entire; (black) 3
2. Intermediate tibiæ with one calcarium; claws simple; hypopygidium of male with three spines ....Scoliinæ p. 616
Intermediate tibiæ with two calcaria; claws cleft; hypopygidium of male with a curved aculeus ....Eliinæ p. 617
3. Intermediate tibiæ with two calcaria; hypopygidium of male unarmed ....Anthoboscinæ p. 618
Intermediate tibiæ with one calcarium; hypopygidium of male with a curved aculeus ....Tiphiinæ p. 618

Scoliinæ.

Key to Genera.

Anterior wings with two recurrent veins....**Campsomeris** p. 617
Anterior wings with one recurrent vein ....**Scolia** p. 616

Scolia Fabricius.

Only two species belonging to this genus occur within the region, but some more will probably be found there, and the student should consult the table to the species of the genus *Scolia* by Mr. Banks, published in the *Canadian Entomologist,* vol. 44, 1912, p. 199.

Key to Species.

Abdomen black and white ....**bicincta**
Abdomen black and red ....**dubia**

S. bicincta Fabricius. Howard, Insect Book, Pl. i, Fig. 3. West Rock, New Haven, 30 August, 1905 (H. L. V.).

°**S. dubia** Say. Howard, Insect Book, Pl. i, Fig. 7.

Campsomeris LePeletier.

In American literature this genus has gone under the name *Elis,* but according to the generic type the name *Elis* must apply to the group heretofore known as *Myzine.*

Key to Species.

Small, much less than 19 mm. in length; male and female black marked with yellow .... plumipes

Large, over 19 mm. in length; male almost entirely black; female black, with four large reddish yellow abdominal spots .... quadrimaculata

C. plumipes Drury. Howard, Insect Book, Pl. i, Fig. 11. Wallingford, 25 May, 1899, Milford, 22 May, 1902, New Haven, 23 June, 1903 (W. E. B.).

°**C. quadrimaculata** Fabricius.

This species has not been yet recorded from Connecticut but will probably be found there in the Austral portion of the State.

ELIINÆ.

This subfamily is represented by only one genus which has heretofore, in America, gone under the name *Myzine.*

Elis Fabricius.

In this genus there is great antigeny. The females are much more robust than the males, have short antennæ, while the radial cell is removed from the costal margin of the wing. The males are long, slender, with slender antennæ, and the radial cell touches the costal margin of the wing.

Key to Species.

Legs, in the female, mostly reddish yellow; wings, in the male, strongly yellowish .... quinquecincta

Legs, in the female, black; wings, in the male, nearly clear hyaline .... interrupta

E. quinquecincta Fabricius. Pl. viii, Fig. 4.

This species has usually gone under the name *sexcincta,* but *sexcincta* occurs in the West Indies and probably in the southernmost portion of the United States and is quite a different insect.

It occurs along the coast and up the Connecticut Valley to Hartford, and is not uncommon in July and August, when it will be found on the flowers of many compositæ, especially the goldenrod, and on the flowers of umbellifers.

New Haven, 21 July, 1903, 12 September, 1904 (B. H. W.); Sachem's Head, 1 August, 1904, Westbrook, 30 August, 1904 (H. L. V.).

E. interrupta Say.

This species occurs with the preceding.

New Haven, 20 July, 1904 (W. E. B.); Branford, 12 August 1904 (H. L. V.); North Haven, 3 August, 1905 (B. H. W., H. L. V.).

ANTHOBOSCINÆ.

By CHARLES THOMAS BRUES.

Sierolomorpha Ashmead.

Wings with a large stigma, closed marginal cell, one distinct and one indistinct closed cubital cell, two discoidal cells and trace of a recurrent nervure. The tarsal claws are simple. Antennæ 12-jointed in female and 13-jointed in male.

S. ambigua Ashmead.

Shining black, legs piceous in male and ferruginous in female; abdomen oval, the first segment constricted off from the rest; metathorax margined at the sides. Length 4.5-6 mm.

Salisbury, 29 August, 1904 (W. E. B.).

TIPHIINÆ.

Species belonging to this subfamily are parasitic on the May or June beetles (*Lachnosterna* species).

Key to Genera.

First transverse cubitus present but incomplete **Paratiphia** p. 618
First transverse cubitus wanting ....**Tiphia** p. 619

Paratiphia De Saussure and Sichel.

Habitus of *Tiphia*, but differs in venation. Only one Eastern species described.

°**P. algonquina** Viereck.

First tergite with transverse carina; venation black; wings slightly dusky; clypeus and mandibles of male yellowish.

Tiphia Fabricius.

Key to Species.

1.	Species with a transverse furrow on first dorsal abdominal segment near its middle	2
	Species with no transverse furrow on first dorsal abdominal segment near its middle	3
2.	Antennæ black	**waldeni**
	Antennæ brownish	**brunneicornis**
3.	Face and mesonotum doubly punctate	**inornata**
	Face and mesonotum not doubly punctate	4
4.	Third abscissa of radius forming a straight line with second transverse cubitus	**punctata**
	Third abscissa of radius not forming a straight line with second transverse cubitus	5
5.	Antennæ brownish beneath	**egregia**
	Antennæ black beneath	6
6.	Wings colorless	**relativa**
	Wings with a brownish tint	**relativa** var.

***T. waldeni** Viereck.

Male: length 8 mm.

Type locality: New Haven, 16 August, 1904 (B. H. W.), 14 August, 1906 (W. E. B.). Also, North Haven, 3 August, 1905 (B. H. W.).

***T. brunneicornis** Viereck.

Male: length 7 mm.

Type locality: New Haven, 6 July, 1904 (H. L. V.).

T. inornata Say. Howard, Insect Book, Pl. viii, Fig. 12.

Male: length 7-11 mm. Female: length 12-14 mm.

Occurs all over the State in August and September, and very likely earlier and later than these dates indicate. New Haven, 12 September, 1903, Salisbury, 27 August, 1904, New Milford, 31 August, 1904, Mount Carmel, 10 June, 1908 (W. E. B.); New Haven, 16 August, 1904 (P. L. B.).

T. punctata Robertson.

Male: length 11 mm.

Only one speciment is known to have been taken in the State, and this was taken in New Haven, 4 May, 1904, visiting flowers of *Forsythia suspensa* (H. L. V.).

***T. egregia** Viereck.

Male: length 7 mm.

Type locality: North Haven, 3 August, 1905. New Haven, 20 August, 1905 (H. L. V.), 14 August, 1906 (W. E. B.).

***T. relativa** Viereck.

Male: length 7 mm.

Type locality: North Haven, 3 August, 1905 (B. H. W.). Also, East Hartford, 2 August, 1905, Scotland, 7 August, 1905 (B. H. W.); Rockville, 27 August, 1905 (H. L. V.).

SAPYGIDÆ.

The species belonging to this family are parasitic on bees or Sphecoid wasps. One of the North American species has been bred in the cells of *Sceliphron cementarium,* another is recorded as a parasite on *Osmia halicticola* and another is a parasite on *Chelostoma.* None of the species belonging to this family have as yet been taken within the State, but the two following are likely to occur there.

Sapyga Latreille.

Key to Species.

Yellow line on inner orbits extending beyond summit of eyes; clypeus with lateral and basal margins yellow; second ventral abdominal segment black	**centrata**
Yellow line on inner orbits not reaching to summit of eyes; clypeus with a transverse yellow spot at base	**americana**

°**S. centrata** Say.

°**S. americana** Cresson.

METHOCIDÆ.

Methoca Latreille.

M. stygia Say.

The female of this species, which was described by Say under the name *bicolor,* has a black head, while the remainder of the insect is almost entirely castaneous. The male is black with the wings dusky.

Hartford, 30 June, 1896 (S. N. D.). The species, which looks like an ant, undoubtedly occurs throughout the entire State.

MYRMOSIDÆ.

Myrmosa Latreille.

M. unicolor Say.

The female of this species was described by Blake under the name *thoracica*. It is ferruginous, with the first abdominal segment blackish above; head and thorax are coarsely punctate, and the base of the first ventral abdominal segment is produced into a tooth while the first dorsal segment is transversely carinate. The male is black, and has the second submarginal cell triangular, smaller than the third; the hind coxæ have a blunt tooth above; the second ventral segment unarmed.

It has been taken at New Haven, 26 June, 1902 (E. J. S. M.), 19 June, 1908 (B. H. W.); Hartford, 6 August, 1893 (S. N. D.); and probably occurs throughout the entire State.

MUTILLIDÆ.

The North American species of this group, as well as of the Methocidæ and Myrmosidæ, were tabulated by Fox in a paper entitled "The North American Mutillidæ" (Trans. Amer. Ent. Soc., vol. 25, 1899, pp. 219-292); and additional notes and species were given by Melander under the title "Notes on North American Mutillidæ with Descriptions of New Species" (*Ibid.*, vol. 29 1903, pp. 291-330). All of the species belonging to this family were considered by Fox and Melander to belong to the single genus *Mutilla*. Ashmead has divided this complex genus into a number of genera, some of which are good while others are open to question. The following tabulation of genera is based on Fox's species groups with the Ashmeadian generic name for the same added. In a number of cases these generic names will have to be changed when a study of the genotypes of all the genera of Mutillidæ has been done, but at present this is impossible.

There is such a great difference between the males and females in this family that it is almost impossible to associate the sexes without field observations, and until these observations have been made it is best to treat the sexes as different species.

Key to Genera.

1. Mandibles tridentate 2
Mandibles simple or bidentate 4
2. First abdominal segment subpetiolate, much smaller than second .... **Bruesia** p. 622
First abdominal segment broadly sessile with second 3
3. Female without a pygidium; male with two cubital cells .... **Pseudomethoca** p. 622
Female with a well defined pygidium; male with three cubital cells ....**Nomiaephagus** p. 623
4. Eyes round, polished, not facetted; radial cell truncate at apex; first abdominal segment posteriorly narrower than second .... **Dasymutilla** p. 623
Eyes oval, facetted 5
5. Apex of first abdominal segment nodose, not as wide as base of second; eyes of male emarginate within......**Ephuta** p. 625
Apex of first abdominal segment as wide as base of second 6
within .... **Timulla** p. 625
6. Female with a distinct pygidium; eyes of male emarginate
Female without a pygidium; eyes of male entire within.... **Sphaerophthalma** p. 625

Bruesia Ashmead.

This specific group was also named *Pycnomutilla* by Ashmead. The following key is based on the males.

Key to Species.

Carina of first ventral abdominal segment nearly straight **harmonia**
Carina of first ventral abdominal segment with a strong tooth anteriorly ....**harmoniiformis**

°**B. harmonia** Fox.

The female is ferruginous, with black legs. The second dorsal abdominal segment has pale spots and the pubescence is sparse.

***B. harmoniiformis** Rohwer.

The female is unknown.

Type locality: Lyme, 31 July, 1911 (A. B. C.).

Pseudomethoca Ashmead.

P. canadensis Blake.

Posterior lateral margin of the head dentate or carinate. Female ferruginous, apex of the abdomen blackish. Male black.

Windsor, 27 June, 1905, Westville, 17 September, 1905 (W. E. B.); Colebrook, 21 July, 1905, New Haven, 1 August, 1905 (H. L. V.); Lyme, 29 May, 1910 (A. B. C.). Probably occurs throughout the State.

Nomiæphagus Ashmead.

N. simillimus Smith.

Female: pygidium longitudinally striate; head wider than the thorax; thorax longer than broad; ferruginous; the second segment with two yellowish spots. Male: head and thorax black with black pubescence; second abdominal segment yellowish with reddish pubescence; femora sparsely pubescent. The male was described under the name *sanbornii* by Blake.

New Haven, 4 June, 1904, 20 May, 1905, 22 August, 1910, Wallingford, 20 May, 1900 (W. E. B.); New Haven, 19 September, 1909, Lyme, 1 May, 1910, Manchester, 20 May, 1910 (A. B. C.); New Haven, 16 August, 1904 (P. L. B.), 17 June, 1905 (B. H. W.).

Dasymutilla Ashmead.

Key to Species.

1. Females 2
Males 8
2. Insects clothed with long dense pubescence ....**occidentalis**
Insects sparsely pubescent, or almost nude 3
3. Posterior lateral margins of head not carinate or tuberculate 4
Posterior lateral margins of head carinate or tuberculate.. 7
4. Carina of first ventral abdominal segment produced anteriorly into a sharp tooth ....**ferrugata**
Carina of first ventral abdominal segment obsolete, straight or slightly tridentate; legs black 5
5. No well defined spot of black pubescence at base of second dorsal abdominal segment; carina of first ventral segment tridentate ....**champlaini**
A well defined spot of black pubescence at base of second dorsal abdominal segment 6
6. Carina of first ventral segment obsolete; second dorsal abdominal segment very sparsely punctate at sides ......**vierecki**
Carina of first ventral segment bidentate, anterior tooth much larger and rounded; sides of second dorsal abdominal segment rather coarsely punctate......................**vesta**
7. Scrobes bounded by a carina above ....**scrobinata**
Scrobes not bounded by a carina above..................**cypris**

8. Carina of first ventral abdominal segment produced posteriorly into a long sharp tooth......................occidentalis
Carina of first ventral abdominal segment not produced posteriorly into a long sharp tooth 9
9. First abdominal segment, seen from side, not nodose, short lepeletieri
First abdominal segment longer, seen from side, distinctly nodose 10
10. Entirely black; pubescence grayish; wings subfuscous....gibbosa
Abdomen partly reddish 11
11. Second dorsal segment with rather long yellow hair except basally ....macra
Second dorsal segment with black hair...................... 12
12. Punctuation of first dorsal segment coarse, irregular; pubescence of second segment entirely black ....canella
Punctuation of first dorsal segment regular; pubescence of apex of second segment yellowish ....castor

°**D. canella** Blake.

D. castor Blake.

North Haven, 3 August, 1905 (H. L. V.); New Haven, August, 1906 (B. H. W.).

***D. champlaini** Rohwer.

Type locality; Lyme, 20 May, 1910, 26, 30 September, (A. B. C.).

D. cypris Blake. Howard, Insect Book, Pl. viii, Fig. 7

New Haven, 19 August, 1904 (B. H. W.).

D. ferrugata Fabricius.

New Haven, 23 September, 1899, Montowese, 8 July, (W. E. B.); North Haven, 3 August, 1905 (B. H. W.); B Point, 12 July, 1895 (S. N. D.).

D. gibbosa Say.

Hartford, 6 August, 1893; Black Point, 28 July, 1896 (S. N. D.).

°**D. lepeletieri** Fox.

D. macra Cresson. Howard, Insect Book, Pl. viii, Fig.

New Haven, 3 August, 1905 (H. L. V.); New Haven, July, 1908 (B. H. W.); Black Point, 28 July, 1896 (S. N. D.)

D. occidentalis Linnæus. Large Velvet Ant.

New Haven, 24 July, 1898, 1 September, 1906 (W. E. B.).

*__D. scrobinata__ Rohwer.

Type locality; Lyme, 31 July, 1910 (A. B. C.).

D. vesta Cresson.

Windsor, 26 July, 1905 (W. E. B.); Granby, 30 October, 1905, New Haven, 21 August, 1906 (B. H. W.).

°**D. vierecki** Rohwer.

Ephuta Say.

E. scrupea Say.

Male entirely black. Female unknown.

Stafford, 24 August, 1905, on goldenrod (W. E. B.); Hartford, 17 October, 1910 (A. B. C.).

Timulla Ashmead.

Key to Species.

Legs and abdomen of female black; head and thorax of male black .... **hexagona**
Legs and abdomen of female reddish; head and thorax of male in part reddish .... **ornativentrus**

T. hexagona Say.

Hartford, 30 July, 6 August, 1893, Black Point, 28 July, 1896 (S. N. D.).

T. ornativentris Cresson.

New Haven, 26 July, 1904, Hartford, 29 August, 1904 (H. L. V.), 10 September, 1908 (B. H. W.)

Sphærophthalma Blake.

This genus has not yet been recorded from the State. It is group *pennsylvanica* of Fox.

PSAMMOCHARIDÆ.

This family has for years been known as Pompilidæ. The wasps which belong to this group are very active, and most of them nest in the ground, provisioning their nests with spiders. Some few of these insects are supposed to be parasitic. Recently Nathan Banks[*] has proposed a classification for these insects and given tables for many of the species. The following keys are adapted from his classification.

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[*] Journ. N. Y. Ent. Soc., vol. 19, 1911, pp. 219-237.

Key to Subfamilies.

1. Claws of hind tarsi bent at right angle; antennæ inserted well above clypeus; spiracle situated in a depression and opening forward labrum exserted for its entire length; propodeum bilobed at base ....CEROPALINÆ p. 626

Claws of hind tarsi not bent at right angle; propodeal spiracle not in a depression and not opening forward 2

2. Labrum exserted for its entire length; propodeal spiracle situated nearly twice its length from anterior margin of propodeum ....NOTOCYPHINÆ p. 627

Labrum never entirely exserted; propodeal spiracle not much more than its length from anterior margin of propodeum 3

3. First abscissa of subdiscoidal vein joining second abscissa of discoidal vein at right angles; second sternite with a transverse furrow (obsolete in some males) ....PEPSINÆ p. 627

First abscissa of subdiscoidal vein projecting posteriorly at base so as to form a pocket where it joins second abscissa of discoidal vein .....................PSAMMOCHARINÆ p. 629

CEROPALINÆ.

By HENRY LORENZ VIERECK.

This distinct subfamily contains only the genus *Ceropales*.

Ceropales Latreille.

At least one species in this genus is said to be a parasite in the nest of *Agenia*.

Key to Species.

1. Females 2

Males 4

2. Body mostly black; posterior femora reddish ....**bipunctata**

Head and thorax black; abdomen reddish..............**robinsoni**

Body black, with white or yellow markings 3

3. Antennæ as long or longer than head and thorax together .. **fraterna**

Antennæ shorter than head and thorax together ....**longipes**

4. Abdomen entirely black ....**bipunctata**

Abdomen not entirely black 5

5. Abdomen not reddish 6

Abdomen reddish ....**robinsoni**

6. Legs almost entirely black ....**fraterna**

Legs reddish ....**longipes**

C. bipunctata Say. Howard, Insect Book, Pl. v, Fig. 10. Length 14-15 mm.

Occurs throughout the State. New Haven, 18 August, 1904, 22 August, 1906 (P. L. B.); Branford, 3 September, 1904 (H. L. V.).

C. fraterna Smith.

Length 5-10 mm. This species has been observed by the Peckhams attempting to interfere with *Anoplius scelestus* which was dragging a spider to its own nest.

Occurs throughout the State. Thompson, 11 July, 1906 (H. L. V.).

C. robinsoni Cresson.

Length 6-8 mm.

Occurs throughout the State.

C. longipes Smith.

Length 7-8 mm.

NOTOCYPHINÆ.

This subfamily is not as yet represented in the fauna of Connecticut.

PEPSINÆ.

Key to Tribes.

Hind tibiæ without spines or only with very weak ones, never serrate .... PSEUDAGENIINI p. 627
Hind tibiæ more or less serrately spined, if nearly smooth as in some males then nervellus is not before cubitus .... PEPSINI p. 628

PSEUDAGENIINI.

Males often have the transverse furrow on the second sternite obsolete; the last joint of the hind tarsi is without strong spines beneath; the nervellus situated before the cubitus.

Key to Genera.

Dorsal aspect of propodeum with erect hair ..**Pseudagenia** p. 627
Dorsal aspect of propodeum without erect hair ..**Ageniella** p. 628

Pseudagenia Kohl.

Key to Species.

1. Legs red ....**mellipes**
   Legs black 2
2. Wings with a large dusky spot below and including stigma; body black ....**caliptera**
   Wings hyaline, or slightly dusky at tips; body metallic blue.. **architecta**

°**P. mellipes** Say.

°**P. caliptera** (Cresson).

Found in the neighboring states.

P. architecta (Say).

According to Walsh this species makes a nest of clay, forming an irregularly cylindrical cell which is provisioned with spiders.

Recorded from Connecticut and probably collected at Farmington.

Ageniella Banks.

Key to Species.

Pronotum with white marks .... **calcarata**
Pronotum without white marks .... **iridipennis**

A. calcarata (Cresson).

Legs pale; calcaria white; length 6-7 mm.

The type material, in part at least, in all probability came from Farmington through Mr. Edward Norton.

A. iridipennis (Cresson).

Wings hyaline, iridescent, dusky at tip; calcaria whitish; body all black; legs black, except anterior tibiæ and tarsi beneath.

New Haven, 4 July, 1905 (H. L. V.).

PEPSINI.

Wings well developed.

Key to Genera.

Last joint of the hind tarsi without spines beneath; nervellus before the cubitus .... **Priocnemis** p. 628
Last joint of the hind tarsi distinctly spined beneath; nervellus beyond the cubitus .... **Cryptocheilus** p. 629

Priocnemis Schiödte.

Key to Species.

1. Antennæ partly yellowish .... **nupera**
Antennæ black 2
2. Abdomen in part red 3
Abdomen black 4
3. Hind legs red; wings with a well defined cloud .... **alienata**
Hind legs black; wings without a cloud .... **notha**
4. Tibiæ strongly serrate to tip; coxæ very hairy; stigmal cloud indistinct or wanting .... **conica**
Tibiæ not strongly serrate near tip; coxæ scarcely hairy; wings with a distinct stigmal cloud .... **germana**

°**P. nupera** Cresson. Howard, Insect Book, Pl. vi, Fig. 3. Body ferruginous; wings dark; length 14-18 mm.

Likely to occur in the Alleghenian Zone of the State.

P. alienata (Smith). Howard, Insect Book, Pl. v, Fig. 3. Apparently common. Poquonock, 27 June, 1906 (H. L. V.).

P. notha Cresson.

Coxæ without much hair; abdomen shining; third cubital cell longer than broad.

Has been recorded from the State and probably came from Farmington.

P. conica (Say).

Clypeus truncate. Moves backward when carrying its prey, a lycosid spider.

Occurs throughout the State. New Haven, 7 May, 1906 (H. L. V.).

P. germana Cresson.

Clypeus truncate.

Recorded from the State and probably was collected at Farmington by Norton.

Cryptocheilus Panzer.

Key to Species.

Dorsal aspect of propodeum hairy, and transversely striate; wings pale before tip .... **unifasciatus**

Dorsal aspect of propodeum scarcely hairy and hardly striate; wings all black .... **fulvicornis**

C. unifasciatus (Say). Howard, Insect Book, Pl. xi, Fig. 11.

Judging from the distribution of this species it should be found throughout the Carolinian Zone of the State.

C. fulvicornis (Cresson).

Distribution similar to the above species.

PSAMMOCHARINÆ

The following generic key is almost a copy of Banks' latest views on the subject. Some few of the genera included in the key are not at present known to occur in the State.

Key to Genera.

1. Pronotum longer than mesonotum, nearly flat above, scarcely arched longitudinally; last joint of hind tarsi without

spines beneath; fore tarsi of female without comb; no erect hair on metanotum 2

Pronotum shorter than mesonotum, plainly arched longitudinally 3

2. With two submarginal cells ....**Planiceps**

With three submarginal cells ....**Pedinaspis**

3. Basal abdominal segment with appressed pubescence, different from that on following segments; pronotum with posterior margin membranous and often white; third cell as broad as long ....**Episyron** p. 631

Basal segment of abdomen not with pubescence different from following segments 4

4. No erect hair on metanotum above, only pubescence 5

Erect hair on metanotum above 9

5. Metanotum produced angularly at posterior corners; but two submarginal cells ....**Aporinellus** p. 631

Metanotum not produced angularly behind; usually three submarginal cells 6

6. Metanotum transversely striate; marginal cell as long as distance to tip; third cell long, and wide above ......**Ridestus**

Metanotum not transversely striate 7

7. Marginal cell short, subtriangular, much more than its length from tip of wing; third submarginal cell much narrowed, triangular, or petiolate above; basal vein usually a little before the transverse median ....**Pompiloides** p. 631

Marginal cell long, hardly its length from tip of wing; third submarginal cell wide above; basal vein of fore wings interstitial with the transverse median 8

8. Hind tarsi spined, apical joint spined beneath; propodeal spiracle opening posteriorly; abdomen cylindrical, first segment subequal in length with second, not much narrowed anteriorly; large, ferruginous ......**Arachnophroctonus** p. 632

Hind tarsi not, or but feebly, spined, apical joint without spines; propodeal spiracle opening sublaterally; abdomen depressed, first segment longer than second and narrower anteriorly; slender black with yellow marks ....
Sericopompilus p. 632

9. A short longitudinal impressed line or groove on posterior part of pronotum; head nearly or fully as broad as long; not wholly black 10

No such impressed line or groove on pronotum; often wholly black ....**Psammochares** p. 632

10. Metanotum distinctly grooved at base; upper margin of clypeus nearly evenly convex ......**Arachnophroctonus** p. 632

Metanotum not grooved at base; upper margin of clypeus sinuate or zigzag ....**Batazonus**

Episyron Schiödte.

This interesting genus can easily be recognized by the characters given in the key.

Key to Species.

Apical abdominal segment with a white spot; wings pale except apex **5-notatus**
Apical abdominal segment black; wings uniformly blackish.. **biguttatus**

E. biguttatus Fabricius.

Provisions its nest with *Epeira labyrinthea,* according to the Peckhams.

Occurs throughout the State.

E. 5-notatus Say.

According to the Peckhams, this species provisions its nest with *Epeira strix.*

Occurs throughout the State.

Aporinellus Banks.

This genus has usually gone under the name *Aporus* until recently, when Mr. Banks has shown that the true *Aporus* is a very different insect.

A. fasciatus Smith.

Black, densely clothed with silver pile.

Occurs throughout the State.

Pompiloides Radoszkowski.

Key to Species.

1. Abdomen marked with red 2
Abdomen entirely black 4
2. Posterior margin of pronotum arcuately emarginate ..**marginatus**
Posterior margin of pronotum sharply, angularly emarginate 3
3. Wings uniformly black; larger ....**tropicus**
Wings darker at apex ....**americanus**
4. Black; posterior margin of pronotum subangularly emarginate **cylindricus**
Bluish; posterior margin of pronotum arcuately emarginate 5
5. Wings fusco-hyaline; three basal abdominal segments without dense pile ....**subviolaceus**
Wings hyaline; three basal abdominal segments with dense silvery pile ....**argenteus**

°**P. americanus** Beauvais.

P. argenteus Cresson.

Occurs along the coast and up the large river valleys.

P. cylindricus Cresson.

Probably occurs throughout the State. Branford, 5 July, 1904, Poquonock, 27 June, North Haven, 3 August, 1905 (H. L. V.); East Hartford, 2 August, 1905 (B. H. W.).

P. marginatus Say.

Occurs throughout the State. Torrington, 7 July, 1905 (W. E. B.); Putnam, 12 July, North Haven, 3 August, 1905 (H. L. V.).

P. subviolaceus Cresson.

Stratford, 16 August, 1904 (H. L. V.).

P. tropicus Linnæus. Howard, Insect Book, Pl. vii, Fig. 11.

New Haven, 20 July, 1904 (B. H. W.).

Sericopompilus Ashmead.

S. humilis Cresson.

Posterior margin of the pronotum subarcuately emarginate; black; posterior tibiæ with a white spot near the base; wings hyaline, apex bifasciate.

New Haven, 9 June, 1905 (B. H. W.).

Arachnophroctonus Ashmead.

A. interruptus Say. Howard, Insect Book, Pl. v, Fig. 1.

Large; ferruginous, marked with black; wings yellowish. Preys on the spider *Epeira strix*.

Can be found throughout the State. Sachem's Head, 1 August, 1904 (H. L. V.).

Psammochares Latreille.

Mr. Banks separates this genus into the following subgenera on characters found only in the female sex.

Key to Subgenera.

1. Clypeus deeply emarginate in middle .... **Lophopompilus** p. 634
   Clypeus not more than gently concave 2
2. No distinct tarsal comb .... **Anoplius** p. 633
   A distinct tarsal comb 3
3. Third joint of antennæ very short, hardly longer than first **Sophropompilus**
   Third joint of antennæ much longer than first .... **Psammochares** p. 633

As this key is founded only on the females the following tabulation based on easily recognized characters is given.

Key to Species.

1.	Abdomen marked with reddish yellow	**atrox**
	Abdomen entirely black	2
2.	Posterior margin of pronotum arcuately emarginate	3
	Posterior margin of pronotum angulately emarginate	5
3.	Third cubital cell triangular; wings darker apically; length about 12 mm.	**tenebrosus**
	Third cubital cell not triangular, although narrowed above; wings nearly uniformly black; length more than 16 mm.	4
4.	Clypeus of female deeply emarginate; last dorsal abdominal segment of male regularly, rather narrowly rounded	**æthiops**
	Clypeus of female gently incurved; last dorsal abdominal segment of male broadly rounded and sightly emarginate	**relativus**
5.	Wings much darker apically; tarsal comb of female obsolete	**virginiensis**
	Wings nearly uniformly blackish; tarsal comb of female present	6
6.	Large, 12 mm. or more in length; clypeus of female deeply emarginate	**philadelphicus**
	Small, 10 mm. or less in length; clypeus of female gently incurved	7
7.	Tarsal claws of male cleft; apical ventral abdominal segments of male with much erect hair; abdomen bluish; prothorax of female almost nude	**luctuosus**
	Tarsal claws of male toothed; apical ventral abdominal segments of male without erect hair; abdomen black; prothorax of female with much black erect hair	**scelestus**

P. (Anoplius) virginiensis Cresson.

Recorded from the State, but without definite locality.

P. (Psammochares) luctuosus Cresson.

Said to occur all over the State. New Haven, 30 June, 1905 (B. H. W.); Colebrook, 21 July, 1905 (H. L. V.); New Canaan, 14 September, 1905 (W. E. B.).

P. (P.) relativus Fox.

Branford, 19 September, 1904 (H. W. W.).

P. (P.) scelestus Cresson.

Recorded from Connecticut and probably was collected at Farmington by Norton; New Haven, 18, 24 June, 1902 (E. J. S. M.).

P. (P.) tenebrosus Cresson.

Recorded from the State and probably inhabits only the Boreal part.

P. (Lophopompilus) æthiops Cresson. Howard, Insect Book, Pl. v, Fig. 19.

Occurs along Long Island Sound. New Haven, 3 October, 1902 (B. H. W.); Branford, 3 September, 1904 (H. L. V.).

P. (L.) philadelphicus Le Peletier.

New Haven (A. E. V.). Norton also took this species in the State, probably near Farmington.

P. (L.) atrox Dahlbom. Howard, Insect Book, Pl. vii, Fig. 14.

Recorded from the State; and has also been taken at New Haven, 18 September, 1903, Westville, 19 July (W. E. B.); Branford, August, 1905 (H. W. W.).

EUMENIDÆ.

By Henry Lorenz Viereck.

Solitary wasps, with males and females that may dig in the ground, burrow in pith or wood, or make mud nests, *e. g.*, the mud-pot of the potter wasp. These nests are stored with various insects.

Key to Genera.

1.	Abdomen petiolate	2
	Abdomen sessile	3
2.	Maxillary palpi with three joints	**Zethus** p. 634
	Maxillary palpi with four joints	**Eumenes** p. 634
3.	First segment of abdomen funnel-shaped	**Nortonia** p. 635
	First segment of abdomen not funnel-shaped	4
4.	Maxillary palpi with three joints	**Monobia** p. 635
	Maxillary palpi with six joints	**Odynerus** p. 635

Zethus Fabricius.

Head wider than high, the second segment of the abdomen in the form of a globular bell. Only one species occurs in the State.

Z. spinipes Say.

Wings violet; more than 13 mm. in length.

Eumenes Fabricius.

This genus comprises the potter wasps, which make symmetrical pots of clay in which to lay their eggs and rear their young. But a single species is found in the East.

E. fraterna Say. Potter Wasp. Pl. viii, Fig. 5 (adult); Pl. iv, Fig. 2 (nest).

Wings smoky, with violet iridescence. Length 13-17 mm.

Occurs throughout the State, and is known to store its nests with canker-worms and caterpillars of butterflies. New Haven North Haven, Hamden, Branford, Orange, Stafford (W. E. B., B. H. W., H. L. V., E. J. S. M.).

Monobia De Saussure.

Another genus represented in the State by but one species.

M. quadridens Linnæus. Howard, Insect Book, Pl. v, Fig. 2.

Length 20 mm. Black, with whitish markings which make it very like *Odynerus bidens,* from which it is superficially distinguished by the clypeus being armed with two teeth.

Undoubtedly occurs throughout the State. New Haven, 13 May, 1904, 25 July, 1905 (W. E. B.); Branford, 25 July, 1905 (H. W. W.); Stonington, 26 July, 1906 (J. A. Hyslop).

Nortonia De Saussure.

Also represented by but one species in the East.

N. symmorpha De Saussure.

Length 17 mm. Black, shining, with yellow markings; antennæ reddish beneath; wings transparent, brown, with beautiful violet reflections.

Odynerus Latreille.

A large genus with many species representing it in this State.

Key to Species.

1. First abdominal segment with a transverse keel 2
   First abdominal segment without a transverse keel 17
2. First abdominal segment with a longitudinal groove down the middle and with a whitish or yellowish apical border (**Symmorphus**) 3
   First abdominal segment without a longitudinal groove down the middle (**Ancistrocerus**) 7
3. Second abdominal segment with a whitish or yellowish apical border 4
   Second abdominal segment without a whitish or yellowish apical border, the third and fourth abdominal segments with a yellowish apical border; length 11 mm.... **philadelphiæ**

4. Third abdominal segment with a whitish or yellowish apical border 5
Third abdominal segment without a whitish or yellowish apical border 6
5. Third and fourth abdominal segments with a yellowish apical border ....**walshianus**
Third and fourth abdominal segments with a whitish apical border ....**albomarginatus**
6. Fourth and following abdominal segments without a whitish or yellowish apical border, the first and second abdominal segments only bordered, and these with the border apical and yellowish; base of tibiæ yellowish ....**debilis**
Fourth abdominal segment, as well as the first and second, with a yellowish apical border, the remaining segments not bordered; tibiæ more or less reddish............**cristatus**
7. Wings fusco-violaceous 8
Wings subhyaline or smoky; abdomen as well as antennæ mostly black 9
8. Postscutel black; apical margin of second dorsal abdominal segment smooth ....**spinolæ**
Postscutel yellowish; apical margin of second dorsal abdominal segment rough ....**unifasciatus**
9. Abdomen with four or five yellowish fasciæ............... 10
Abdomen with three yellowish fasciæ; postscutel yellow... **campestris**
10. Thorax quadrate 11
Thorax oblong 13
11. Ornaments yellowish 12
Ornaments whitish ....**waldeni**
12. Second dorsal abdominal segment with two yellowish spots **birenimaculatus**
Second dorsal abdominal segment without yellowish spots **birenimaculatus** var.
13. Propodeum with a sharp border 14
Propodeum rounded behind ....**campestris**
14. Postscutel black or with inconspicuous marks.............. 15
Postscutel more or less yellowish 16
15. Ornaments yellowish ....**capra**
Ornaments whitish ....**albophaleratus**
16. Body robust, black and shining ....**catskilli**
Body slender, elongate ....**tigris**
17. Thorax quadrate 18
Thorax oblong 23
18. Wings subhyaline or clouded or reddish 19
Wings blackish or fuscous; ornaments whitish or luteous; propodeum maculated; second dorsal segment without a luteous margin ....**bidens**

19. Body with extensive reddish ornaments 20
Body with whitish, yellowish, or luteous ornaments........ 21
20. Postscutel yellowish ....**dorsalis**
Postscutel black .... **boscii**
21. Postscutel yellowish or whitish; propodeum separated from the postscutel by a fissure or notch; second dorsal abdominal segment without yellow spots; scutel black.............. 22
Postscutel black ....**boscii**
22. Ornaments whitish ....**leucomelas**
Ornaments yellowish ....**foraminatus**
23. Postscutel black 24
Postscutel yellowish 25
24. Thorax with yellowish ornaments; first abdominal segment (and sometimes second) with a yellowish margin..**nortonianus**
Thorax black ....**nortonianus** var.
25. Second abdominal segment with two free yellowish spots.. 26
Second abdominal segment without free yellowish spots.... 32
26. First abdominal segment with two yellowish spots or oblique yellowish lines 27
First abdominal segment without yellowish spots........... 29
27. Second abdominal segment with its apical margin slightly reflexed 28
Second abdominal segment with its apical margin not sensibly reflexed ....**anormis**
28. First dorsal abdominal segment with free yellowish spots **collega**
First dorsal abdominal segment with oblique yellowish lines **vagus**
29. Postscutel with a yellowish band 30
Postscutel with two yellowish spots................**nortonianus**
30. Second abdominal segment with its apical margin not reflexed 31
Second abdominal segment with its apical margin slightly reflexed ....**collega**
31. First four abdominal segments with yellowish margins..**anormis**
Only first, second, and fourth abdominal segments with yellowish margins ....**pedestris**
32. First and second abdominal segments without free yellow spots 33
First abdominal segment with two yellowish spots.......**collega**
33. Abdomen with yellowish margins on more than the first two segments 34
Abdomen with yellowish margins on only the first two segments, the apical margin of the second segment reflexed **collega** var.
34. Only first, second, and fourth abdominal segments with yellowish margins ....**pennsylvanicus**

First four abdominal segments with yellowish margins, the second segment rather reflexed ....**collega** var.

°O. (Symmorphus) **walshianus** De Saussure.

Length 12 mm.

O. (S.) **albomarginatus** De Saussure.

Length 9 mm.

Apparently occurs throughout the northern section of the State at least.

°O. (S.) **philadelphiæ** De Saussure.

Length 11 mm.

Sure to occur in Connecticut.

O. (S.) **debilis** De Saussure.

Length 8.5 mm.

Found everywhere in the State.

O. (S.) **cristatus** De Saussure.

Length 9 mm.

Found everywhere in the State. Scotland, 30 July, 1904 (B. H. W.).

O. (Ancistrocerus) **spinolæ** De Saussure.

Length 6 mm.

This State is possibly the type locality of this species.

O. (A.) **unifasciatus** De Saussure. Howard, Insect Book, Pl. vi, Fig. 17.

Length 11-15 mm.

Occurs probably throughout the southern portion of the State.

O. (A.) **campestris** De Saussure. Howard, Insect Book, Pl. v, Fig. 5.

Length 13 mm.

Branford, 29 May, 1905 (H. W. W.). Will be found, no doubt, throughout the State.

*O. (A.) **waldeni** Viereck.

Length of female 13 mm.

Type locality: New Haven. Only one specimen is known, and this was caught 15 May, 1903.

O. (A.) **birenimaculatus** De Saussure. Pl. iv, Fig. 1 (nest).

Length 14 mm.

Found throughout New England. Plantsville (A. Shepard); New Haven, 5 June, 1906, Stonington, 1907 (W. E. B.).

O. (A.) **capra** De Saussure. Howard, Insect Book, Pl. v, Figs. 4, 7.

Length 14-17 mm.

Common everywhere in the State. New Haven, Mt. Carmel, Branford, Westbrook, (H. L. V., E. J. S. M., W. E. B., B. H. W., P. L. B.).

O. (A.) **albophaleratus** De Saussure.

Length 10-13 mm.

Very likely occurs throughout the State.

O. (A.) **tigris** De Saussure. Howard, Insect Book, Pl. vi, Fig. 15.

Length 8-11 mm.

Common all over the State. New Haven, (H. L. V., P. L. B.); Sachem's Head, Westbrook, Colebrook (H. L. V.); Branford (H. W. W.); Stafford, Brookfield (W. E. B.).

O. (A) **catskilli** De Saussure.

Length 9.5-11.5 mm.

Has been taken on goldenrod flowers at Scotland (B. H. W.), and will be found throughout the State.

°O. **bidens** De Saussure.

Length 20 mm.

O. **boscii** LePeletier.

Length 14 mm.

Was found in this State by Norton.

O. **dorsalis** Fabricius. Howard, Insect Book, Pl. vi, Fig. 14.

Length 17 mm.

New Haven, 24 June, 1902 (E. J. S. M.).

O. **leucomelas** De Saussure.

Length 9-14 mm.

Was first taken in the State by Norton. New Haven, 24 May, 1904 (H. L. V.).

O. foraminatus De Saussure.

Length 11-13 mm.

Found throughout the State. New Haven (W. E. B., E. J. S. M., P. L. B.); North Haven, Westbrook (H. L. V.); Windsor (W. E. B.); Stonington (J. A. Hyslop).

***O. nortonianus** De Saussure.

Length 9 mm.

Occurs throughout the State. Yalesville, 19 October, 1903 (H. L. V.).

***O. collega** De Saussure.

Length 12 mm.

Very likely to be found throughout the State. Woodbridge, 25 August, 1906 (W. E. B.).

O. anormis Say.

Length 11 mm.

Occurs throughout the State. Branford, 22 August, 1904 (H. W. W.).

O. pedestris De Saussure.

Length 9-10 mm.

All over the State. Has been taken at Double Beach, 5 July, 1904, on the flowers of New Jersey tea. New Haven, 27 June, 1902 (E. J. S. M.).

O. pennsylvanicus De Saussure.

Length 8-9 mm.

Occurs all over the State, and has been taken on flowers of goldenrod and *Pastinaca sativa.* New Haven, (W. E. B., B. H. W., P. L. B., H. L. V., E. J. S. M.); Branford (H. L. V., P. L. B.); Scotland (B. H. W.); Sachem's Head (H. L. V.).

°**O. vagus** De Saussure.

VESPIDÆ.

This family is divisible into two subfamilies, the Vespinæ or monogamic social wasps, and Polybiinæ or polygamic social wasps.

The Polybiinæ are not represented in the northeastern United States but the subfamily Vespinæ is well represented both in individuals and species. It is composed of social wasps, the familiar types of which are the hornet and yellow-jacket. These wasps build nests of paper which is made by chewing wood into small bits. In the Vespini the nest is entirely enclosed leaving only a small circular hole for the entrance of the wasps. In the Polistini, as represented in our region, the nest is broad and flat without an enclosing envelope.

The larvæ of these insects are fed mostly upon the chewed-up remains of Lepidopterous larvæ, although other larvæ, pollen, and honey are used. The larvæ are fed from day to day, no food being stored for them.

This subfamily is parasitized by Diptera, Hymenoptera and Strepsiptera.

VESPINÆ.

According to the writer's views this subfamily may be divided into two tribes by the following characters:

Key to Tribes.

Hind wings long, without an anal lobe; first abdominal segment very broad, sharply truncate anteriorly; mesepisternum without an anterior dorsal plate .... VESPINI p. 641

Hind wings with distinct anal lobe; first abdominal segment subpetiolate, petiolate or conical, never abruptly truncate at base; mesepisternum with a separate dorsal plate along anterior margin ....POLISTINI p. 643

VESPINI.

Key to Genera.

Vertex extending much above eyes; ocelli much below supraorbital line; posterior orbits broad ....**Vespa** p. 641

Vertex not extending above eyes; ocelli slightly caudad of or tangent with supraorbital line; posterior orbits narrow.. **Vespula** p. 642

Vespa Linnæus.

This genus is represented by a single species, supposedly introduced, which is brown and yellow and very large, having a length of 18-22 mm., and builds its nest in hollow trees.

V. crabro Linnæus. Giant Hornet. Pl. viii, Fig. 10.

New Haven, 13 June, 1900, 1 October, 1903 (W. E. B.), 30 June, 1901 (A. L. Winton), 2 November, 1905 (G. R. Bradley), 8 October, 1908 (B. H. W.); Hamden, 28 September, 1901 (R. C. Horsfall); Darien, 13 September, 1906 (E. H. Delafield); Plantsville (A. Shepard).

Vespula Thomson.

This compact, well defined genus may be separated into two subgenera on the length of the malar space as follows:

Key to Subgenera.

Malar space very narrow, eyes touching base of mandibles or separated from them only by a line	**Vespula** p. 642
Malar space very broad, eyes remote from base of mandibles	**Dolichovespula** p. 642

Dolichovespula, new subgenus.

Type: *Vespa maculata* Linnæus.

Key to Species.

1.	Basal three abdominal segments immaculate; markings white; flagellum ferruginous beneath	**maculata**
	Basal three abdominal segments maculate	2
2.	Black and white	**arctica**
	Black and yellow	**diabolica**

V. (D.) **maculata** (Linnæus). *Vespa maculata* Linnæus. White-faced Hornet. Pl. viii, Fig. 16 (adult); Pl. ii, Fig. 1 (nest).

The nest is attached to the limb of a tree.

A very common species, occurring throughout the State. Windsor, New Haven, Wallingford (W. E. B., B. H. W.).

V. (D.) **diabolica** De Saussure. Common Yellow-jacket. Pl. viii, Fig. 13 (adult); Pl. iii (nest).

According to Ashmead this species nests in stumps.

Another common species which occurs throughout the State. New Haven, Mount Carmel, Branford, Prospect, Sachem's Head, Colebrook (W. E. B., B. H. W., H. L. V., H. W. W.).

°V. (D.) **arctica**, new name. *V. borealis* Lewis (Trans. Amer. Ent. Soc., vol. 24, 1897, p. 173), not *V. borealis* Kirby (Fauna Boreali-americana, 1837, p. 264).

This species has been taken in New Hampshire, and at Amherst, Massachusetts, and will undoubtedly be found in northern Connecticut.

Subgenus Vespula Thomson (*s. str.*).

Type: *Vespa austriaca* Panzer (Ashmead, 1902).

To this subgenus belong the numerous smaller vespine wasps so common throughout the United States. Many of the species are closely related, and care must be taken in determining them.

The species of this subgenus, as far as known, build their nests within the ground.

Key to Species.

1. Black and white .... **consobrina**
Black and yellow 2
2. Black spot of first dorsal abdominal segment in the form of a lozenge; scape black .... **germanica**
Black spot of first dorsal abdominal segment in form of a triangle, or transverse 3
3. Base of first dorsal abdominal segment black, with a black point in middle of the yellow posterior margin ......**vulgaris**
First dorsal abdominal segment yellow, with a transverse black spot; scape sometimes entirely black ....**communis**

V. (V.) **consobrina** De Saussure.

Occurs throughout the State. Branford, 24 August, 1904 (P. L. B.); North Haven, 3 August, 1905 (B. H. W.).

V. (V.) **germanica** Fabricius. Howard, Insect Book, Pl. vi, Fig. 24.

Occurs throughout the State. Many specimens from New Haven (B. H. W., H. L. V., P. L. B., W. E. B., E. J. S. M.); Branford (H. W. W.); Mount Carmel (E. J. S. M.).

°V. (V.) **communis** De Saussure.

Sure to be found within the State.

V. (V.) **vulgaris** Linnæus. Howard, Insect Book, Pl. v, Fig. 13.

Occurs throughout the State. New Haven, June, 1905 (B. H. W., A. H. Pierson, J. A. Howarth, Jr.); Branford, August, 1905 (H. W. W.); Prospect, 15 August, 1906 (W. E. B.).

POLISTINI.

Polistes Latreille.*

The species of this genus make nests with exposed cells. They are known to be predaceous, and at least one species takes its victim without first stinging it. They may use old nests, and are said to study a locality to get their bearings.

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*Copied from Mr. Viereck's manuscript.

Key to Species.

1. **Blackish-brown, with a conspicuous yellow margin to first dorsal abdominal segment ....annularis**
Colored otherwise 2

2. **Abdomen with many yellow bands or with yellow spots..variatus**
Abdomen not so; more uniformly brown................pallipes

P. annularis Linnæus. Howard, Insect Book, Pl. v, Fig. 12.

Length 18 mm.

Belongs more to the southern United States, and is therefore not apt to be found outside of the Carolinian Zone in Connecticut.

P. variatus Cresson.

Length 18 mm.

May be found throughout the State. (New Haven, 12 September, 1904 (B. H. W.).

P. pallipes LePeletier. *P. metricus* Say. Common Wasp. Pl. viii, Fig. 8 (adult) ; Pl. ii, Fig. 2 (nest).

Common throughout the State. New Haven (E. J. S. M., B. H. W., W. E. B.) ; Branford (H. W. W.) ; New Canaan (W. E. B.) ; Mount Carmel E. J. S. M.).

SPHECOIDEA.

By Sievert Allen Rohwer.

The wasps grouped together in the superfamily Sphecoidea resemble bees in that the pronotum is developed on the dorsal lateral margin into rounded lobes called tubercules. These tubercules, in some groups, extend beyond the anterior margin of the tegulæ, but in no case does the posterior margin of the pronotum touch the tegulæ as is the case with the superfamilies Vespoidea, Ichneumonoidea, etcetera, nor is the pronotum large and developed laterally.

The European authority, F. F. Kohl, has considered these wasps as belonging to one family; but the American authority, W. H. Ashmead, erected a superfamily for the wasps here treated, and recognized a number of families which, in turn, he divided into subfamilies and tribes. The primary character used by Ashmead in separating families of the superfamily was the number of calcaria on the intermediate tibiæ. This arrangement separated such closely related groups as *Bembex* and *Stizus,* and also brought together certain other insects which are not, according to the present author's views, closely related.

Kohl's treatment of the family did not divide it into subfamilies or tribes; but at the end of his classification he arranged genera, subgenera and species in assemblages which he called generic groups. Many of these groups have been raised to either subfamily or tribal importance in the following classification, and most of the groups Kohl treated as subgenera have been considered as genera, while many of his species groups have been treated as subgenera.

The other important work on Sphecoidea is that of W. J. Fox. Fox's work, although it does not tabulate all the North American genera and subgenera in the outline of classification, which is according to the older methods, is extremely valuable and reliable, but does not succeed, according to the views of the present author, in establishing a natural classification for these insects. The

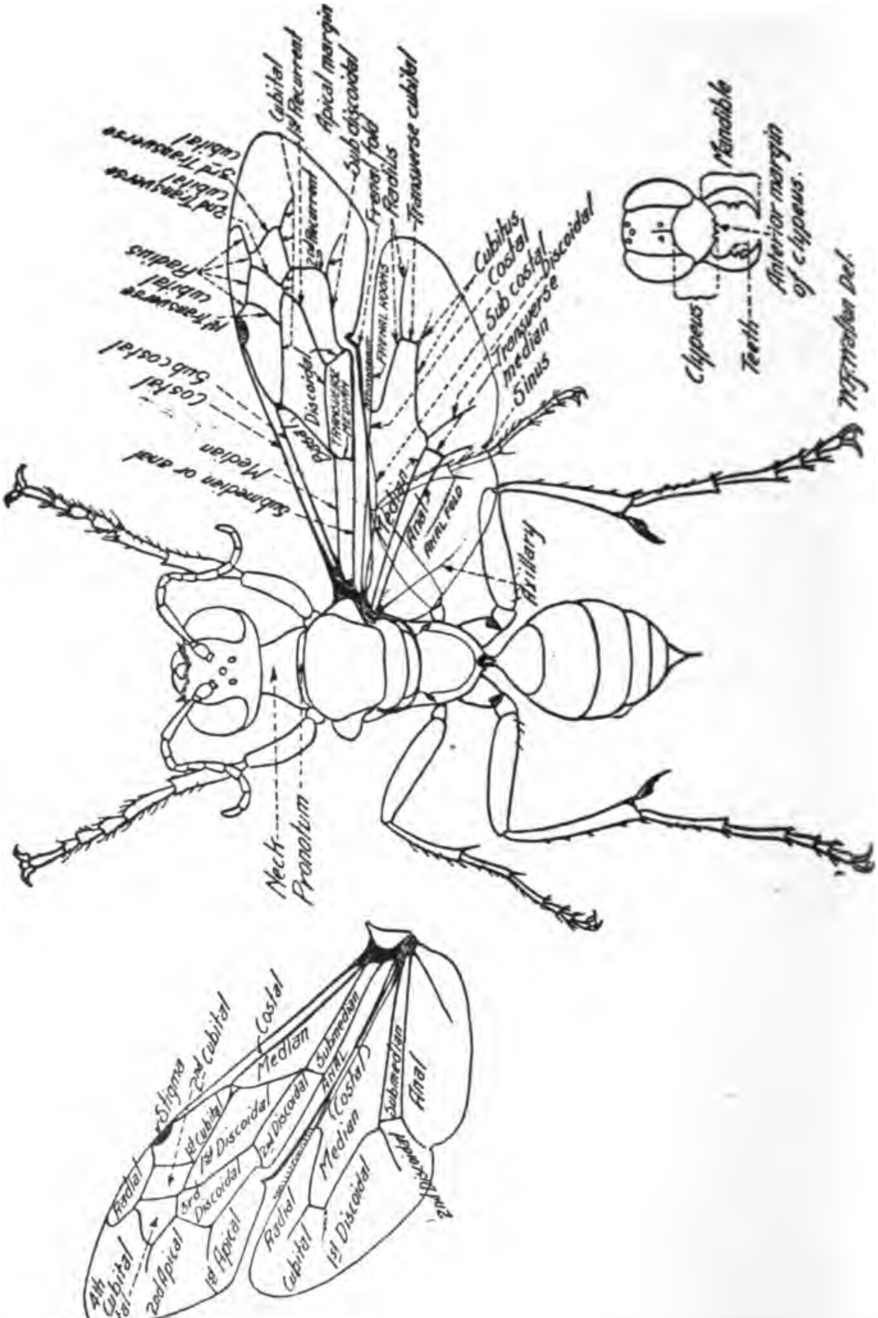

FIG. 14. *Chlorion (Ammobia) ichneumoneum.*

NOMECLATURE OF WING PARTS IN THE DRAWING OF *CHLORION (AMMOBIA) ICHNEUMONEUM.*

OLD SYSTEM	COMSTOCK-NEEDHAM SYSTEM
Front Wings	
Veins	*Veins*
Costal	Costa or C
Subcostal	Sc + R + M
Median	Cubitus or Cu
Submedian or Anal	A*
Radius or marginal	1st abscissa, radial cross-vein or r, 4th abscissa R_s; recurved tip Sc_2+R_{1+2}
Basal	Medio-cubital cross-vein and Media
First transverse cubital	R_s and r-m
Second " "	R_3
Third " "	R_4
Transverse medial	$M_4 + Cu_1$
Discoidal	1st abscissa M_4, 2d abscissa M_3
Cubital	$M+R_{4+5}$; at margin M_1+R_{4+5}
First recurrent	M_{3+4}
Second "	Transverse part of M_2
Subdiscoidal	(1st abscissa) medial cross-vein (2d abscissa) M_2
Cells	*Cells*
Costal	C + Sc
Median or externo-median	M
Submedian or interno-median	Cu + Cu_1
Anal	1st + 2d + 3d A
Marginal or radial	2d $R_1 + R_2$
First submarginal or cubital	1st R_1 + R
Second "	R_3
Third "	R_4
Fourth "	R_5
First discoidal	M_4
Second "	M_3
Third "	1st M_2
First apical	2d M_2
Second "	M_1
Stigma	Stigma or cell Sc_2

---

* The actual composition of this vein is complex, and at its tip would be represented by $M^4 + Cu +^{1+2}$ 1st A + 2d A + 3d A

Hind Wings

Veins	*Veins*
Costal	Costa or C
Subcostal	R + M
Median	Cu and M_4
Anal	1st A; at tip 1st A and 2d A
Radian or Marginal	R_5 (at its tip)
Cubital	m-cu and $R_{4+5}+M_1$
Discoidal	m and M_2
Transverse median	M_3
" cubital	Free part of media or M
Axillary	3d A
Cells	*Cells*
Costal	$C + Sc + Sc_1$
Median	M
Submedian	$Cu + Cu_1 + M_3$
Anal	1st A + 2d A + 3d A*
Marginal or radial	R_{1+2}
Submarginal or cubital	$R + R_3 + R_4 + R_5$
1st discoidal	M_1 + 1st $M_2 + M_4$
2d "	2d M_2

student of this superfamily will, however, do well to examine the work of Fox, and especially his revisions or specific synopses which occur in the various American journals. In some cases where Fox has carefully tabulated the American species of certain genera belonging to this superfamily, the species occurring or likely to occur in the State of Connecticut have been extracted from his table, and nearly all the characters mentioned by Fox have been incorporated within the table. This is especially true in the subfamily Crabroninæ, and, by running an insect to any given species in the keys here given and by following closely the characters there given, it is believed that one can feel reasonably sure that he has correctly determined his species. In cases where Fox has not tabulated the American species, the author has made entirely new keys, and this is also the case in certain groups where, according to his ideas, Fox's arrangements are not the best.

The following keys to the subfamilies are based upon characters found chiefly in the thorax, as it is believed that there is less modification, by variation of the parts used, in this part of the body than in the appendages. The writer fully believes that by careful attention to the body characters, and by ignoring, in the primary division, the characters of the appendages, a more natural classification of these insects will be made.

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* 3d A is part below axillary vein.

Not all of the characters given in the following key will apply equally well to insects which do not occur within this region, and this is especially true of exotic genera. The aim of these keys has been to make the characters as simple, yet as positive and definite as possible, so as to enable the beginner who is unfamiliar with the habitus of the insects in question to correctly place his insect in a given subfamily, tribe and genus. For this reason it has been unadvisable to so form the keys that they will include all the genera of the world. At some later time the writer hopes to elaborate the classification here proposed so that it will include the genera of the world. To do this will necessitate the making of a number of additional tribes and perhaps a few subfamilies.

The nomenclature of the thorax is that given by Snodgrass in his paper entitled "Thorax of the Hymenoptera," published in the Proceedings of the United States National Museum, vol. 39, no. 1774, 1910, pp. 37-91, pl. 1-16.

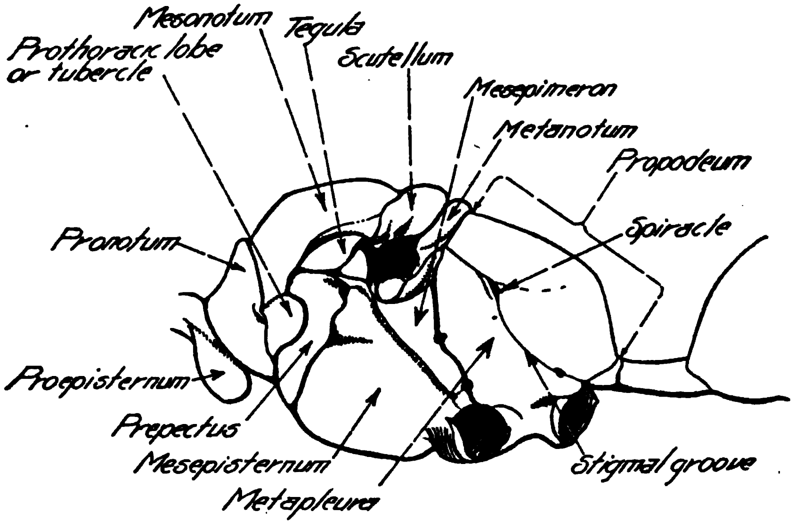

FIG. 15. Thorax of *Chlorion* (*Ammobia*) *ichneumoneum*.

In the main, the insects belonging to the superfamily Sphecoidea could be classed as beneficial, as the great majority of them are predaceous and provision their nests with spiders, Homoptera, Lepidopterous larvæ or other insects. Some choose, however, the Diptera as food for their young, but these will have to be classed with the beneficial insects for the present as, so far as is known, none of them collect any of the parasitic flies, while many of them provision their nests with the horse-flies. The genus *Cerceris* should in the main be classed as beneficial since it uses weevils for food. There is one record of this genus as using honey bees, in which case it would have to be classed as injurious. The subfamily Phalanthinæ would, as a rule, have to be considered as injurious, since these insects provision their nests with bees.

The habits of these wasps are very diversified; some nest in colonies; others, and by far the great majority of them, are solitary in their nesting habits. The nests are either constructed into clay cells; made in the sand; or often in abandoned nests, either clay nests constructed by other members of this superfamily or the galleries of other insects being used for a home for the future larvæ. Some species nest within the stems of plants which have a large pithy center. A few, however, are known to actually excavate burrows in solid wood after the manner of the carpenter bee.

Some very interesting observations of the insects belonging to this group have been made by the Peckhams and in many cases reference will be made to their papers. The French student, Fabre, has also made many interesting and original observations on the habits of the European wasps belonging to this superfamily, and any student of the habits of these wasps should become familiar with the papers of this French author, and should endeavor to correlate the habits of the American species with their congeners in Europe.

The following species which are included within the State are, according to the author's views, only a small percentage of the species which actually occur there, and it is to be hoped that students of Entomology within the region covered by this paper will make a special effort to collect Sphecoid wasps, and that it will be possible within a few years to add many species to this list.

Key to Families.

1. Mesosternum produced posteriorly into an elongate process which is cleft or bifurcate apically; notauli present; mid tibiæ with two apical spurs; prothorax long; propodeum long; femora swollen near middle; prepectus present.... AMPULICIDÆ p. 651

Mesosternum not produced into an elongate process; notauli wanting; prothorax usually transverse; femora normally not swollen in the middle 2

2. Prepectus present ....SPHECIDÆ p. 652

Prepectus wanting 3

3. Antennæ inserted close to clypeus; cheeks narrow; first abdominal segment not narrower than second; lower posterior margin of propodeum angled due to metathoracic pleural suture being dorso-ventral; no dorsal plate to mesepisternum ....BEMBICIDÆ p. 691

Antennæ inserted much above clypeus; cheeks broad; first abdominal segment much narrower than second; lower posterior margin of propodeum rounded due to metathoracic pleural suture being curved; a dorsal plate to mesepisternum ....CERCERIDÆ p. 694

AMPULICIDÆ.

Within our area there is but one genus which belongs to this family. The wasps belonging to this genus are small, about 10 mm. long, black, and have the wings more or less marked with fuscous. The habits of our species are unknown, but the European *Ampulex compressus* preys on cockroaches.

Rhinopsis Westwood.

Key to Species.

Clypeus not carinate apically, apical middle margin quinquedentate, the sides of its production sinuate; mandibles rufo-ferruginous; head uniformly sculptured; pronotum finely, transversely striato-granular posteriorly; mesoscutum without large lateral punctures; notauli not foveolate; mesepisternum granular, with a few large punctures dorsally ....**caniculatus**

Clypeus with a carina in apical middle with one apical tooth, sides of its production not sinuate; mandibles, except the piceous apices, black; front striato-punctate, the rest of the head finely granular, with large scattered punctures; pronotum coarsely, transversely striato-reticulate; notauli foveolate; sides of mesoscutum with large punctures; mesoscuto-scutellar suture strongly foveate; mesepisternum with large punctures which are dorsally confluent........**melanognathus**

°R. caniculatus Say.

*R. melanognathus Rohwer.

Manchester, 13 September, 1910 (A.B.C.). This is the type locality of this species.

SPHECIDÆ.

By far the greater number of the Sphecoidea belong to the family Sphecidæ. As a family, the group is rather complex, being composed of a number of types, but all of these are held together by the presence of a prepectus. Within the family the prepectus takes a number of forms, but in no case has any difficulty arisen as to its presence or absence.

Key to Subfamilies.

1. Prepectal suture originating below lower margin of prothoracic tubercule, prepectus therefore wanting between tubercule and tegula ....NYSSONINÆ p. 653
   Prepectal suture originating posterior to prothoracic tubercule, prepectus therefore present between tubercule and tegula 2
2. Prepectus defined posteriorly by a strong carina which is angulate opposite prothoracic tubercule; an oblique suture from below tegula to sternum, where it joins prepectal carina 3
   Prepectus defined posteriorly by a suture; no suture from below tegula to prepectal suture 5
3. Antennæ inserted near middle of face; mesepisternum with a dorsal and ventral plate; abdomen petiolate; wings with three cubital cells ....PSENINÆ p. 657
   Antennæ inserted very close to dorsal margin of clypeus; mesepisternum without a dorsal plate; abdomen sessile, or subsessile; wings with one cubital cell 4
4. First cubital and first discoidal cells confluent; propodeum with a process at dorsal middle; metanotum with processes at sides; eyes with their inner margins subparallel ...... OXYBELINÆ p. 659
   First cubital and first discoidal cells separate; propodeum and metanotum without processes; eyes with their inner margins strongly converging below ....CRABRONINÆ p. 660
5. Abdomen with a strong constriction between first and second ventral segments 6

Abdomen without a constriction between first and second ventral segments 8

6. Clypeus with a lobe at dorsal middle; antennæ inserted well above clypeus near middle of face; intermediate tibiæ with two apical spurs ....PHILANTHINÆ p. 671

Clypeus with dorsal margin nearly straight; antennæ inserted very close to dorsal margin of clypeus, much below middle of face 7

7. Inner margins of eyes deeply emarginate; intermediate tibiæ with one apical spur ...................TRYPOXYLONINÆ p. 675

Eyes at most reniform, mesal margins subparallel; intermediate tibiæ with two apical spurs ....MELLININÆ p. 677

8. Intermediate coxæ without a transverse suture near base; propodeum long, with spiracles well removed from base; abdomen with a long petiole; intermediate tibiæ with two apical spurs ....SPHECINÆ p. 678

Intermediate coxæ with a transverse suture near base; propodeum shorter, and with spiracles close to metanotum; abdomen usually sessile, but, when petiolate, intermediate tibiæ have only one spur 9

9. Metasternum with a large process which is deeply emarginate ventrally; intermediate tibiæ with one apical spur; wings with three cubital cells; radial cell with an appendage .... LARRINÆ p. 683

Metasternum without a large, deeply emarginate process.. 10

10. Abdomen depressed, dorsal surface flattened; intermediate tibiæ with two apical spurs; radial cell truncate; wings with three cubital cells ....ASTATINÆ p. 687

Abdomen cylindrical or in a very few cases subdepressed, dorsal surface convex; intermediate tibiæ with one apical spur; venation various ................PEMPHREDONINÆ p. 688

NYSSONINÆ.

As used here, this subfamily is the family Nyssonidæ of Ashmead with the subfamily Astatinæ removed. Following Kohl's arrangement, it is the " Gattungsgruppe " *Alyson* and the isolated genera *Gorytes* and *Nysson*. In Viereck's arrangement in the New Jersey List it is the families Gorytidæ, Alysonidæ and Nyssonidæ. The subfamily is easily recognized by the prepectus. But little is known about the habits of these insects. The Nyssonini nest in sand as do also the Gorytini and Hoplisini. The latter two provision their nests with Homoptera and according to Westwood prefer those of the family Cercopidæ.

Key to Tribes.

1. Mesepisternum without a dorsal plate; lateral dorsal angles of propodeum dentate or sharply angulate; second cubital cell petiolate ....NYSSONINI p. 655
   Mesepisternum with a dorsal and ventral plate; propodeum not dentate 2

2. Second pleural suture strongly angulate, mesepimeron therefore much broader above; pronotum long, cephalo-caudal length approximating same length of scutellum; slender insects; second cubital cell petiolate ....ALYSONINI p. 654
   Second pleural suture straight or nearly so, mesepimeron therefore nearly parallel-sided; pronotum transverse; stout species; second cubital cell sessile 3

3. Sternauli wanting; mesepisternum with an oblique suture from below tegulæ to prepectal carina............GORYTINI p. 655
   Sternauli present; mesepisternum without an oblique suture from below tegulæ to prepectal carina ......HOPLISINI p. 656

ALYSONINI.

Only one genus of this tribe is known to occur within the State. The habits of none of the Nearctic species belonging to this tribe are known.

Alyson Jurine.

Slender species; inner margins of the eyes subparallel, dorsal margin of the clypeus irregularly convex, propodeum long, with a sharply defined posterior face; first recurrent vein received by the first cubital cell near the apex; the second recurrent vein received by the second cubital cell near the apex; transverse median vein distinctly basad of the basal vein.

Key to Species.

1. Females 2
   Males 3

2. Thorax black ....oppositus
   Thorax red ....melleus

3. Legs and clypeus black ....oppositus
   Legs partly fulvous, clypeus yellow ....melleus

A. oppositus Say.

Thompson, 11 July, 1905 (H. L. V.). Probably generally distributed throughout the State.

°**A. melleus** Say.

NYSSONINI.

This tribe is represented in the State by one genus which is divisible into a number of subgenera, but as only three species are known to occur within the State the names of subgenera have been omitted.

Nysson Latreille.

The species of this genus, according to Ashmead, nest in sand.

Key to Species.

1. Submedian cell of hind wings terminating before origin of cubitus; markings yellow .... **tramosericus**
   Submedian cell of hind wings terminating at or before origin of cubitus 2
2. Scutellum margined at sides; last dorsal segment of abdomen, in male, ciliated between teeth .... **æqualis**
   Scutellum not margined at sides; last dorsal segment of the abdomen, in male, not ciliated between teeth .... **lateralis**

N. æqualis Say.

N. lateralis Packard.

Both this and the preceding species occur nearly throughout the State.

N. tramosericus Viereck.

Poquonock, 27 June, 1905 (H. L. V.).

GORYTINI.

Key to Genera.

First abdominal segment as broad apically as second is basally .... **Gorytes** p. 655
First abdominal segment much narrower apically than second is basally .... **Paramellinus** p. 656

Gorytes Latreille.

Gorytes mystaceus (Linnæus), according to Westwood, preys on the larvæ of *Aphrophora spumaria.* This is an European species, but is related to the American species, which may have similar habits. No species of this genus has as yet been taken in the State, but *G. nigrifrons* Smith will no doubt be found in the Austral life zone. This species is black, marked with yellow, the yellow band on the first dorsal abdominal segment is larger than that of the following segments. The radial cell is fuscous. The mesoscuto-scutellar suture and the furrows defining the triangular shaped area of the propodeum are foveolate. The legs beyond the bases of the femora are black.

Paramellinus Rohwer.

P. bipunctatus (Say).

This is the only species of *Paramellinus* known in the East. It is shining black with white markings. The second and third dorsal abdominal segments have lateral whitish spots. The wings are clear. The recurrent veins are usually interstitial with the first and second transverse cubiti. The eyes are large, oval in outline, being closer together a short distance above the antennæ.

East Hartford, 9 August, 1904 (B.H.W.).

HOPLISINI.

Hoplisus LePeletier.

The species placed in the genus at present may belong in a number of different subgenera when the group is studied from the standpoint of the genotypes. The species, as far as known, prey on leaf-hoppers and nest in the sand. For an interesting account of *canaliculatus* Packard, see Barth, Bull. Wisconsin Nat. Hist. Soc., vol. 5, no. 3, 1907, pp. 141-149, fig. 4.

The following table is based on the females, as the males of but a few of the species are known.

Key to Species.

1. Inner margin of eyes strongly converging to clypeus........ 2
   Inner margin of eyes parallel or subparallel 3
2. Propodeum coarsely sculptured; wings not yellow basally: femora mostly black; flagellum yellow beneath, long and slender; posterior face of propodeum with two yellow spots ....**atricornis**
   Propodeum smooth; fourth and fifth dorsal abdominal segments impunctate; suture between scutum and scutellum not foveolate ....**phaleratus**
3. Last dorsal abdominal segment ferruginous..............**gracilis**
   Last dorsal abdominal segment yellow ....**fuscus**
   Last dorsal abdominal segment black 4
4. Mesepisternum sharply, strongly carinate anteriorly; pygidium broad, more than twice as broad as the width in the middle; a distinct fuscous cloud in second discoidal cell **nebulosus**

Mesepisternum not sharply or strongly carinate anteriorly; pygidium long, narrow, more than twice as long as its width in the middle; form robust ....**costalis**

H. fuscus Taschenberg.

Flagellum of the male cylindrical except the apical joint; first abdominal segment black.

This species is recorded, without definite locality, by Handlirsch.

H. costalis Cresson.

New Haven, 24 August, 1906 (P.L.B.).

H. gracilis Patton.

This species was recorded from Connecticut by Patton.

H. phaleratus Say. Howard, Insect Book, Pl. 1, Fig. 18.

This species occurs throughout the State and has been taken in July and August.

H. nebulosus Packard.

Scotland, 27 July, 1904 (B. H. W.); Branford, 12 August, 1904 (H. W. W.); New Haven, 19 July, 1904 (P. L. B.).

°**H. atricornis** Packard.

This species has been recorded from neighboring states but not yet been taken in Connecticut.

PSENINÆ.

The abdomen is always petiolate although the length of the petiole is variable. The antennæ are inserted in the middle of the face, well above the clypeus. The wings have three enclosed cubital cells, the radial cell is always pointed at the apex. The inner margins of the eyes are subparallel. The intermediate coxæ are separated.

They nest either in sand or wood and provision their nests with Homoptera. For an account of one of the Nearctic species, see Barth, Bull. Wisconsin Nat. Hist. Soc., vol. 5, no. 4, 1907, pp. 251-257.

Key to Genera.

Transverse median of hind wings short and perpendicular; cubitus of hind wings originating beyond transverse median **Psenulus** p. 658

Transverse median of hind wings long, oblique or bent near middle; cubitus of hind wings originating before or nearly interstitial with transverse median ....**Psen** p. 658

Psenulus Kohl.

In America there are, as yet, no true Psenuli, but the genus is represented by the subgenus *Neofoxia* Viereck, which differs from true *Psenulus* in that the second cubital cell receives only one recurrent vein or the second recurrent is interstitial with the second transverse cubitus.

°P. (Neofoxia*) trisculcus (Fox).

This species may be found in the State. The pygidium is broad and has large separate punctures. There is a tubercle between the bases of the antennæ. Black; flagellum pale beneath.

Psen Latreille.

Key to Subgenera.

Second cubital cell receiving one recurrent vein, second recurrent received near base of third cubital cell; clypeus with anterior margin depressed ....**Psen** (*s. str.*) [illegible]

Second cubital cell receiving both recurrent veins, or second recurrent interstitial with second transverse cubitus; clypeus without a distinct depressed anterior margin...... **Mimesa** [illegible]

Subgenus **Psen** Latreille (*s. str.*).

°P. (Psen) monticola (Packard).

Abdomen entirely red. Tibiæ and tarsi testaceous.

Subgenus **Mimesa** Shuckard.

Key to Species.

1. Mesoscuto-scutellar suture foveolate; scutum coarsely punctate .... [illegible]
   Mesoscuto-scutellar suture not foveolate; scutum nearly impunctate or with fine scattered punctures .... [illegible]
2. Petiole strongly trisulcate .... [illegible]
   Petiole not trisulcate, flat above, and longer .... [illegible]
3. Tegulæ brown; base of flagellum pale; scutum more coarsely sculptured; flagellum of male with joints rounded on beneath .... [illegible]
   Tegulæ and flagellum black; flagellum of male simple ...... myersiana
4. Petiole trisulcate; abdomen black ....nigrescens
   Petiole cylindrical; abdomen with some red .... [illegible]

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* It has been recently shown that this group should be called *Diodontus*. See Rohwer, 1915, Proc. U. S. Nat. Mus., vol. 49, p. 243.

5. Petiole shorter than hind femora .... pauper
Petiole as long as hind femora .... cressoni

°**P. (Mimesa) niger** Packard.

Black; wings dusky; tarsi brownish.

°**P. (M.) kohlii** (Fox).

Black; tarsi testaceous; wings hyaline; pygidium narrow, with large separate punctures,

°**P. (M.) myersianus** Rohwer.

Similar to *kohlii* but smaller and more shining.

°**P. (M.) nigrescens** Rohwer.

Black; flagellum beneath and tarsi testaceous; wings hyaline; slender; petiole shorter than hind femora.

P. (M.) pauper (Packard).

Black; flagellum beneath and tarsi testaceous; second and third abdominal segments red.

Prospect, 15 August, 1906 (W. E. B.).

P. (M.) cressoni (Packard).

First (beyond petiole), second, third and base of fourth abdominal segments red; wings hyaline; flagellum beneath and tarsi testaceous.

Salisbury, 29 August, 1904; Westville, 9 September, 1907 (W. E. B.).

OXYBELINÆ.

The wasps belonging to this subfamily are easily separated from all other Sphecoid wasps by the remarkable processes on the dorsum of the thorax and by having the first cubital and first discoidal cells confluent. The wasps nest in sand and provision their nests with flies.

Key to Genera.

Process at dorsal middle of propodeum broad and deeply emarginate at tip .... **Notoglossa** p. 660
Process at dorsal middle of propodeum spine-like, acute at apex .... **Oxybelus** p. 659

Oxybelus Latreille.

O. quadrinotatus Say. Howard, Insect Book, Pl. iii, Fig. 22.

Length about 6 mm.; squamæ curved; abdomen shining, sparsely punctate; wings hyaline. For an account of the habits of this species see Peckham, Bull. 2, Wisconsin Geol. and Nat. Hist. Survey, 1898, pp. 73-76. See also Parker, Proc. Entomol. Soc. Washington, 1915, vol. 17, p. 74.

Occurs throughout the State. Has been taken in July and August on flowers of milkweed. Many specimens from Branford, Colebrook, New Haven, Poquonock, Prospect, Putnam, and Scotland.

Notoglossa Dahlbom.

N. emarginata (Say).

Squamæ with a sharp curved point outside of the broad basal part; abdomen dull, finely, rather closely punctate.

Occurs throughout the State and has been recorded from Branford, Cheshire, East Hartford, New Haven, Poquonock, Sachem's Head, Scotland, and West Haven, on flowers of milkweed and New Jersey tea. Flies from June to August.

CRABRONINÆ.

The wasps belonging to this group are seldom more than 15 mm. in length and range from this size to 3 mm. in length. All of the species in the eastern United States are either black or black and yellow. The small species are usually entirely black while the large ones are black with yellow thoracic and abdominal markings. These insects are easily recognized by the quadrate or subquadrate heads, and by the venation, the important parts of which are the truncate radial cell, the presence of the cubitus at the base and the presence of only one cubital cell. The habits of these insects are very varied. Some nest in stems, some in galleries in wood and others in the soil. A few of the species use spiders to provision their nests, while some use flies; others use bugs; others, aphids; others, moths; and one is said to use mites. It is a curious, but suggestive, circumstance that as far as the evidence goes the different food and nesting habits are directly associated with the specific groups pointed out by certain writers. This problem may be more elucidated at some future time when the habits of these wasps are more fully known and when the generic groups are more thoroughly understood. In the meantime students who have the opportunity will be doing valuable work in recording careful observations on the habits of any species belonging to this family.

The insects falling into the subfamily Crabroninæ may be separated into two tribes by the following key.

Key to Tribes.

Abdomen depressed, flat beneath; second discoidal cell much longer than first, acuminate at tip ......ANACRABRONINI p. 661
Abdomen seldom subdepressed, convex dorsally and ventrally; second discoidal cell shorter than first, usually very much so, broadened and subtruncate at tip ..CRABRONINI p. 661

ANACRABRONINI.

Anacrabro Packard.

A. ocellatus Packard.

Length 6-8 mm. Black; tubercules, line on metanotum, tips of all the femora, tibiæ and tarsi (except a black spot on the former internally); and a large spot (sharply truncate externally, and more or less pointed within) on first to fifth dorsal abdominal segments, yellow. Wings subhyaline basally, apically fuscous. Mesoscutum and mesepisternum with strong, separate punctures. According to Dr. Barth (Bull. Wisconsin Nat. Hist. Soc., vol. 6, pp. 147-153, Pls. 7-9), this species nests in sand banks and provisions its nest with the bug *Lygus pratensis*.

Hartford and Black Point in July (S. N. D.).

CRABRONINI.

The Nearctic species belonging to this tribe were tabulated by Fox in a paper entitled "The Crabroninæ of Boreal America," which appeared in the Transactions of the American Entomological Society, vol. 22, 1895, pp. 129-226. In this paper Mr. Fox considered that all the species placed in the tribe Crabronini, as here treated, belong to one genus. Later, in 1898, Ashmead tabulated the genera of Sphecoidea of the world, and considered the Crabroninæ of Fox to be a family composed of a number of subfamilies. In his paper Ashmead raised nearly all of Fox's species groups to generic rank. In the present paper the tribe Crabronini is considered as comprising, as far as our region is concerned, four genera, each of which may be divided into subgenera, some of which occur in the State. These genera may be separated by the following table:

Key to Genera.

1. Mandibles simple, acute at apex .... **Lindenius** p. 664
   Mandibles truncate, bidentate or tridentate at apex 2
2. First abdominal segment petioliform or abdomen distinctly petiolate .... **Rhopalum** p. 664
   Abdomen sessile or subsessile 3
3. Mesepimeron with a strong carina following the second pleural suture; mesepisternum strongly sculptured with some form of striation .... **Solenius** p. 664
   Mesepimeron without a strong carina; mesepisternum not strongly sculptured, usually only punctate ...... **Crabro** p. 669

The following two species are too imperfectly known to be classified according to the above system. In the hope that they will be rediscovered and redescribed to harmonize with our present views of the classification of this group, the original descriptions are here given.

Crabro oblongus Packard. Proceedings Entomological Society of Philadelphia, Vol. vi, p. 88.

"Female. Closely allied to *C. singularis*, head of much the same proportions, but narrows a little behind, and is throughout narrower as the entire body is. Eyes a little nearer together; the convexity of the vertex and the grooving of the front the same as in *C. singularis*. Antennal groove well marked, polished, on each side a narrow edging of silken pubescence; clypeus golden as in *C. singularis*, but the hairs are much finer, the lateral lobes are more triangular and silvery; mandibles black, with the middle wedge-shaped area twice grooved towards the base, where in *C. singularis* it is smooth; palpi slender, joints much longer and slenderer by one-third than in the other species above named. Antennæ as in *C. singularis*, scape entirely yellow, hardly as stout, joints of flagellum a little stouter. Two square, yellow spots on the prothorax; lateral tubercle yellow; mesothorax entirely black above with no yellow markings; surface of the scutum finely striated; scutellum and metascutellum highly polished. Propodeum much as in *C. singularis*, but the mesial furrow widens at base, with similar lateral and transverse rugæ; legs colored much the same; within the hind tibiæ a dark stripe. Abdomen long, sides unusually parallel, giving it an oblong shape; with ten yellow fasciæ, those in the basal joint being simply dots, those in the second ring much larger than the succeeding ones, not wedge-shaped, but elliptical; beneath very convex; tip one-half as long as in *C. singularis*, the enclosed triangular upper surface much longer and narrower than in the allied species.

"Length of body, .64; head and thorax, .33; abdomen, .31 inch. Conn. (Norton).

"Differs from *C. singularis* in its much narrower and slenderer body, narrower head, larger palpi, with mandibles grooved towards insertion in the middle area; in the wholly black mesothorax, except the yellow tubercle; and in the abdomen having an additional pair of fasciæ. The tip of the abdomen is scarcely one-half as large, of different proportions, being longer and narrower than in *C. singularis*, while the abdomen is much flattened above, where in *C. singularis* it is much more convex."

Probably belongs to *Solenius*, and to the subgenus *Lophocrabro*.

C. unicus Patton. Canadian Entomologist, Vol. xi, p. 214.

"Female. Length 5 mm. Black; tips of mandibles, tegulæ, spurs of posterior tibiæ and extreme base of the first joint of posterior tarsi, the last joint of posterior tarsi, the tips of all the coxæ and trochanters and the tips of the posterior femora and tibiæ, piceous. Scape beneath, dot on first joint of flagellum, the tubercles, the four anterior tibiæ excepting a black spot beneath, and the tips of the four anterior femora, yellow. The four anterior tarsi, excepting the fulvous apical joint, and the base of the posterior tibiæ, whitish. Clypeus black, covered with a silvery pile; flagellum fulvous beneath. Thorax beneath and the abdomen with short scattered pubescence. The abdomen excepting the rufo-piceous enclosure on the sixth segment entirely black. Wings hyaline, beautifully iridescent, the nervures and stigma black. Head, thorax and abdomen smooth. The head as wide as the thorax, and the vertex *longer than wide*, the front narrow. The ocelli arranged in an equilateral triangle, each in a separate depression; from the anterior ocellus an impressed line extends downwards upon the face and another extends backwards upon the vertex; on the inner orbit on the vertex is a slight groove curving at the end to come in a line with a short oblique groove behind each posterior ocellus. Prothorax sharply angulated beneath, mesopleura sharply angulated beneath near the coxæ. Anterior portion of the mesonotum with four short lines which extend upon the collar as slight notches; mesonotum with a slight groove on each side of the disk and with a marginal row of reticulations over the tegulæ. Scutellum quadrate, connected with the mesonotum by the broad lateral angles between which it is separated by a basal row of large reticulations. The semi-circular area on base of metathorax is encircled by a row of similar reticulations and divided by a deep median groove. Similar rows of reticulations extend in a slightly curved line down upon the mesopleura from the anterior wings and others mark the lateral sutures of the metathorax. The sides of the mesothorax beneath and the sides and posterior face of the metathorax are finely striate; these striæ curve upon the metathorax above and are represented within the enclosure by striæ of microscopic fineness. The posterior face of the metathorax has a deep triangular median depression above and is more coarsely rugose beneath. Area on the sides much thickened and raised. Abdomen shorter than the rest of the body, narrow at base, broad near the tip. The posterior tibiæ much thickened.

"New Haven, Conn., July 15th.

"The elongate head and clavate abdomen give this species a very peculiar appearance."

Lindenius LePeletier.

But one species of this interesting little genus has been found in Connecticut.

L. errans (Fox).

Clypeus and scape posteriorly black; hind tibiæ yellow at the base only; ocelli in a low triangle; the convexities of the dorsal aspect of the propodeum smooth and polished; cheeks unarmed.

Rockville, 23 August, 1905 (H. L. V.).

Rhopalum Kirby.

This genus, like the preceding, is represented by only one species within the State. Pygidium of the female narrow and excavated for its entire length. Flagellum of the male dentate beneath.

R. pedicellatum Packard.

Abdomen black, four anterior legs banded with black.

This species was recorded from Connecticut by Packard, and has been taken at New Haven, 8 June, 1896 (W. E. B.).

Solenius LePeletier.

This is the Crabroninæ of Ashmead. For reasons of this change of names see the remarks under the genus *Crabro* (p. 669).

Key to Subgenera.

1. Anterior margin of clypeus in middle produced into a strong truncate lobe; pygidium narrowly channeled 2
Anterior margin of clypeus rounded or dentate, never with a strong median truncate portion 4
2. Ocelli in an equilateral triangle ....**Clytochrysus** p. 665
Ocelli in a low triangle 3
3. Abdomen coarsely punctate as are also head and thorax; flagellum of male simple; fore tarsi slightly flattened .. **Solenius** (*s. str.*) p. 665
Abdomen rather finely punctate as are also head and thorax; flagellum of male with basal joints emarginate; fore tarsi strongly flattened ....**Ectemnius** p. 666

4. Mesoscutum striato-punctate, anteriorly transversely, posteriorly longitudinally .... **Lophocrabro** p. 667
Mesoscutum not striato-punctate 5
5. Abdomen indistinctly punctate or impunctate **Xestocrabro** p. 667
Abdomen distinctly punctate 6
6. Female pygidium flat, triangular; fore tarsi of male strongly flattened .... **Protothyreopus** p. 668
Female pygidium narrow, strongly excavated; fore tarsi of males not or scarcely flattened .... **Hypocrabro** p. 668

Subgenus **Clytochrysus** Morawitz.

° Only one species of this group has been recorded from Connecticut, but another one, according to its distribution, may occur within the confines of the State. The following table will separate these two species:

Key to Species.

First joint of flagellum, in female, fully as long as three following united; first and second joints of flagellum, in male, more strongly dentate than third and fourth; fore femora of male black and yellow .... **obscurus**
First joint of flagellum, in female, scarcely as long as three following united; first four flagellar joints, in male, with teeth subequal; anterior femora of male rufous, striped with yellow and black .... **nigrifrons**

S. (C.) obscurus Smith.

New Haven, 8 July, 1904 (P. L. B.); Colebrook, 21 July, 1905 (H. L. V.).

°**S. (C.) nigrifrons** Cresson.

Subgenus **Solenius** LePeletier (*s. str.*).

The two species which belong to this group and occur in the eastern United States may be separated as follows:

Key to Species.

Posterior face of propodeum completely transversely striato-reticulate; scape of male angulate near apex; first three flagellar joints of male largest, so flagellum is thicker at base .... **producticollis**
Posterior face of propodeum with a strong median channel and longitudinally striato-reticulate along it; scape and flagellum of male normal .... **interruptus**

S. (S.) interruptus LePeletier. Howard, Insect Book, Pl. iv, Fig. 6.

This species occurs throughout the State, and has been taken in New Haven, North Haven, Sachem's Head, Scotland, and Stafford, in May, June, July, August, and September.

S. (S.) **productícollis** Packard.

New Haven, 14 August, 1906 (P. L. B.).

Subgenus **Ectemnius** Dahlbom.

No species of this group is known to occur in the State, but any of the following may be found there.

Key to Species.

1. Females 2
   Males 4
2. Space between eyes at clypeus shorter than length of first two joints of flagellum; transverse depressions of pronotum broad and strong; scutellum finely striate ..... **corrugatus**
   Space between eyes at clypeus at least equal in length to first two joints of flagellum; transverse depressions of pronotum narrow and not strong 3
3. Longitudinal furrow of propodeum broad and distinctly widened in middle; pronotum margined but not strongly so **brunneipes**
   Longitudinal furrow of propodeum rather narrow and not widened in middle; pronotum sharply margined...... **montanus**
4. First joint of intermediate tarsi shorter than or subequal with three following united 5
   First joint of intermediate tarsi longer than three following united 6
5. Occiput and cheeks sharply margined behind; longitudinal furrow of propodeum rather narrow .... **montanus**
   Occiput and cheeks feebly margined; longitudinal furrow of propodeum broad .... **brunneipes**
6. Scape entirely yellow; abdomen broad, not longer than head and thorax united; posterior face of propodeum distinctly enclosed .... **corrugatus**
   Scape partly black; abdomen elongate, longer than head and thorax united; posterior face of propodeum not completely enclosed, as ridge separating it from dorsal surface is obsolete .... **pauper**

°S. (E.) **montanus** Cresson.

°S. (E.) **pauper** Packard.

°S. (E.) **brunneipes** Packard.

°S. (E.) **corrugatus** Packard.

Lophocrabro, new subgenus.

Type: *Crabro singularis* Smith.

This name is proposed for the group which Ashmead considered as *Crabro*. Supraorbital foveæ obsolete; pygidium of the female narrowed apically and deeply channeled, with a fringe of long, stiff, lateral hair; third antennal joint of the male much more slender than the remaining joints; femora of the male dentate beneath; fore tarsi of the male flattened.

Only one species of this group occurs in the territory treated.

S. (L.) singularis Smith.

This species was later considered to be the same as *maculatus* Fabricius, but the evidence is not sufficient. First joint of the flagellum longer than the two following united; yellow markings of the second abdominal segment pointed inwardly; yellow marks of the fifth segment separated.

Recorded from Connecticut by Fox.

Subgenus Xestocrabro Ashmead.

Key to Species.

1. Females 2
   Males 3
2. Dorsal and posterior aspects of propodeum not separated by a series of foveæ; posterior face striate above; mesoscutum closely punctate throughout ....**sayi**
   Dorsal and posterior aspects of propodeum separated by a series of strong foveæ; posterior face transversely rugose; mesoscutum with punctures separated posteriorly ..**trifasciatus**
3. First joint of flagellum distinctly longer than second; first and second joints of intermediate tarsi strongly produced within; anterior femora reddish beneath..................**sayi**
   First joint of flagellum subequal in length with second; first and second joints of intermediate tarsi scarcely produced within; anterior femora yellow beneath ....**trifasciatus**

S. (X.) sayi Cockerell. *S. sexmaculatus* Say and Fox, not Olivier.

Occurs throughout the State throughout the summer and early fall months, and is often found visiting flowers of *Cicuta maculata*. Branford, Brookfield, Colebrook, New Canaan, Sachem's Head, and Stonington.

°**S. (X.) trifasciatus** Say.

Subgenus **Protothyreopus** Ashmead.

Key to Species.

Mesoscutum very coarsely sculptured; head and thorax of female coarsely sculptured; first joint of intermediate tarsi of male normal, slightly longer than two following united **rufifemur**

Mesoscutum not coarsely sculptured; head and thorax of female finely sculptured; first joint of intermediate tarsi of male strongly angular on outer margin and slightly shorter than following two joints united .... **bigeminus**

S. (P.) rufifemur Packard.

Sachem's Head, 1 August, 1904; New Haven, 4 July, 1905 (H. L. V.), on New Jersey Tea.

S. (P.) bigeminus Packard.

New Haven, 26 June, 1902 (E.J.S.M.).

Subgenus **Hypocrabro** Ashmead.

As treated here this subgeneric name is used to include also *Pseudocrabro* and *Xylocrabro* as defined by Ashmead.

Key to Species.

1. Females 2
Males 4
2. Pygidium without a distinct lateral fringe of stiff hairs; abdomen never banded but with lateral spots .... **stirpicola**
Pygidium with a distinct fringe of stiff hairs 3
3. Mesoscutum with strong punctures which are separated on posterior portion .... **decemmaculatus**
Mesoscutum closely and finely punctate throughout.. **chrysargynus**
4. Flagellum entire beneath .... **decemmaculatus**
Flagellum emarginate beneath 5
5. Dorsal aspect of propodeum with strong foveæ laterally .. **stirpicola**
Dorsal aspect of propodeum without strong foveæ laterally **chrysargynus**

S. (H.) stirpicola Packard.

This species makes cells within the stems of plants which have a large pith, and provisions these cells with various species of flies.

New Haven, 28 July, 1898, taken as it was boring into a cane of Japanese wineberry (W. E. B.).

S. (H.) decemmaculatus Say.

This species is known to prey on horse-flies. It has been taken at New Haven, 26 July, 1902 (E. J. S. M.).

S. (H.) chrysargynus LePeletier. Howard, Insect Book, Pl. iv, Fig. 19.

Short Beach, 14 July, 1904 (P. L. B.).

Crabro Fabricius.

In 1810 Latreille fixed, as the type of the genus *Crabro, Sphex cribraria* Linnæus. Ashmead in 1898, while tabulating the genera of Crabroninæ, overlooked this fixation by Latreille, and chose the same species as the type of *Thyreopus*. This causes the group which Ashmead called Thyreopinæ to become Crabroninæ, and the genus *Thyreopus* must fall as a synonym of *Crabro*.

Key to Subgenera.

1. Ocelli arranged in an obtuse triangle; abdomen marked with yellow 2
   Ocelli arranged in or nearly in an equilateral triangle; abdomen black 3
2. Anterior margin of clypeus with a large quadrate projection; first recurrent vein received before apical third of first cubital cell; antennæ of male simple, not dilated; fore tarsi of male without appendages ......**Synothyreopus** p. 669
   Anterior margin of clypeus without a projection; first recurrent vein received at or beyond apical third of first cubital cell; antennæ of male dilated; fore tarsi of male with an appendage ....**Crabro** p. 670
3. Supraorbital foveæ sharply defined; propodeum without a well defined circular area; pygidium narrow, foveated.... **Blepharipus** p. 671
   Supraorbital foveæ obsolete; propodeum with a well defined circular area; pygidium broad, flat ....**Crossocerus** p. 671

Subgenus Synothyreopus Ashmead.

The males belonging to this group are easily recognized by the characters given in the subgeneric table. The females offer some difficulty but by close study can be placed. Two species belonging to this group have been taken within the State.

Key to Species.

Flagellum scarcely twice the length of scape ....**tumidus**
Flagellum much more than twice the length of scape....**advena**

C. (S.) **advena** Smith.

Female: head and thorax coarsely sculptured; dorsal aspect of the propodeum very coarsely sculptured with strong longitudinal or slightly oblique ridges which extend to the posterior aspect; scape partly yellow; postocellar line subequal with the ocellocular line; first two abdominal segments with two yellow spots, those of the second pointed internally. Male: cheeks armed with a keel; clypeus yellow; tibial shield dark brown, marked with fine yellowish lines; mesepisternum striato-punctate.

This species has been recorded from the State but definite data are wanting.

C. (S.) **tumidus** Packard.

Female: head and thorax without long shaggy pubescence; wings subhyaline; mesepisternum not striate; hind tarsi testaceous; space between the eyes at the base of the clypeus less than the length of the second and third antennal joints. Male: mesosternum nude; mesepisternum finely punctate; metanotum black; fore femora yellow beneath.

Westbrook, 30 August, 1904 (H. L. V.).

Subgenus Crabro Fabricius (*s. str.*).

Key to Species.

1. Females 2
Males 5
2. First transverse cubitus received before middle of radial cell 3
First transverse cubitus received about middle of radial cell 4
3. First joint of flagellum distinctly shorter than second; lateral margin of pronotum with a strong tooth ....**argus**
First joint of flagellum distinctly longer than second; mesoscutum shining, finely closely punctate ....**æqualis**
4. Dorsal aspect of propodeum very coarsely sculptured with strong longitudinal ridges; scape black ....**provancheri**
Dorsal aspect of propodeum not coarsely sculptured, striæ incomplete and fine; clypeus and mandibles black...**monticola**
5. First joint of flagellum not broadened to meet second; tibial shield brownish, covered with pale spots; scutellum and metanotum black ....**argus**
First joint of flagellum broadened to meet second 6
6. First joint of flagellum not hirsute beneath; tibial shield very large ....**latipes**
First joint of flagellum with a bunch of pale, curved hair beneath ....**cribrellifer**

°C. (C.) **cribrellifer** Packard.

°C. (C.) **monticola** Packard.

°C. (C.) **provancheri** Fox.

°C. (C.) **latipes** Smith.

C. (C.) **æqualis** Fox.

New Haven, 3 August, 1905 (H. L. V.).

C. (C.) **argus** Packard.

West Haven, 27 to 29 June, 1905 (H. L. V., W. E. B.).

Subgenus **Blepharipus** LePeletier.

No species of this genus has yet been recorded from the State but the following two may be looked for:

Key to Species.

Pronotum and scutellum yellow	**impressifrons**
Thorax entirely black	**nigricornis**

°C. (B.) **impressifrons** Smith.

°C. (B.) **nigricornis** Provancher.

Subgenus **Crossocerus** LePeletier.

As yet this genus has not been definitely recorded from Connecticut, but the following three species may be found there. The males of the following species are not described.

Key to Species.

1.	Mandibles in greatest part yellow; scutellum black; convexities of dorsal aspect of propodeum opaque, with five striations	**minimus**
	Mandibles, except apices, black	2
2.	Scutellum black; basal third of intermediate tibiæ yellow; two yellow spots on pronotum	**sulcus**
	Scutellum mostly yellow; intermediate tibiæ yellow exteriorly; a yellow band on pronotum	**lentus**

°C. (C.) **minimus** Packard.

°C. (C.) **sulcus** Fox.

°C. (C.) **lentus** Fox.

PHILANTHINÆ.

As used here, the subfamily Philanthinæ includes only the Philanthinæ of Ashmead's classification, or the genus *Philanthus* and allies of other authors. The group of *Cerceris* is considered to be in a different family and can easily be separated by the characters stated in the key to families.

Key to Genera.

Inner margins of eyes not emarginate; apex of radial cell not reaching costa .... **Aphilanthops** p. 672
Inner margins of eyes emarginate; apex of radial cell attaining costa .... **Philanthus** p. 672

Aphilanthops Patton.

This genus is represented in the State by a single species. One of the western species is known to use ants to provision its nest.

A. frigidus (Smith).

Clypeus with the apical margin quinquedentate. First joint of the flagellum distinctly shorter than the second and third. Markings yellow; pubescence white. For an account of this species, which provisions its nests with queen ants, see Wheeler, *Jour. Anim. Behavior,* 1913, vol. 3, pp. 374-387.

Hartford, 30 July, 6 August, 1893.

Philanthus Fabricius.

The members of this genus are easily recognized by the large subtransverse head, which is wider than the thorax. The body is usually punctate, although in some cases sparsely so. The markings are whitish or yellowish, with reddish legs in some species. The wings are hyaline or subhyaline. The shape of the eyes will easily separate this from *Aphilanthops*. ***Philanthus*** has been divided by some writers, on venational characters, into subgenera, but when species other than the genotypes are used the variation is found to be so great that it is impossible to place certain specimens under such subgenera satisfactorily. The Nearctic species may be divided into groups by the primary character of the following key. Treating these groups as subgenera, we would have *Pseudanthophilus* and *Philanthus* (=*Epiphilanthus* and *Anthophilus*).

As far as known these wasps prey on bees. In Europe *P. triangularus* preys on the honey-bee, one insect being sufficient for one cell.

Key to Species.

1. Pronotum anteriorly carinated and sharply truncate; body nearly uniformly closely, coarsely punctate ....**ventilabris**
Pronotum not carinated, anteriorly declivous; body not uniformly punctate, or if uniformly punctate not coarsely so.. 2
2. Abdomen with very large, usually confluent punctures, segments constricted basally and depressed apically ....**punctatus**
Abdomen at most finely punctate, segments not both constricted and depressed 3
3. Flagellum tapering to thickened apex; venter with dense, long hair 4
Flagellum of nearly uniform width beyond apex of first joint; flagellum short; venter without dense long hairs, although with some scattered hairs 5
4. First abdominal segment without a yellow spot; third transverse cubitus straight; mesoscutum with fine, rather close punctures; length about 12 mm. ....**sanbornii**
First abdominal segment with a yellow spot on each side; third transverse cubitus sinuate; mesoscutum with fine, widely scattered punctures; length about 8 mm. ......**dubius**
5. Abdomen impunctate, first segment black, second with two U-shaped yellow marks, the arms of the U projecting posteriorly ....**bilunatus**
Abdomen distinctly punctate, first segment with yellow markings, second segment without such yellow marks 6
6. Dorsal aspect of propodeum uniformly sculptured, without a large depressed area; abdomen closely, finely punctate, first segment with a yellow band ....**solivagus**
Dorsal aspect of propodeum with a depressed median area which is surrounded by an impunctate area; abdomen very sparsely punctate, first segment with two pale spots..**politus**

°**P. (Pseudanthophilus) ventilabris** Fabricius.

This species has not yet been taken in the State, but it has been taken in other eastern states and will no doubt be found here.

P. (Philanthus) punctatus Say.

The coarsely punctate abdomen makes this species easy to recognize. Dorsal aspect of the propodeum has a shallow depressed median area; sides of propodeum rather finely, closely punctate; first abdominal segment black; base of the second dorsal segment with a broad yellow band, the band on the following segments narrow and at the apical margin. Wings dusky.

According to Ashmead this species provisions its nest with *Halictus disparalis* and other small Halicti. The Peckhams give an interesting account of this species, which in brief is as follows: The wasps of one nest live together in harmony after emerging until the females begin to make nests, then they disband, although the males often use the old nest for a shelter at night. The nest is a tunnel in sandy clay, a longitudinal section being roughly L-shaped, the shorter arm oblique, the longer one nearly parallel with the surface. The prey is small Halicti which are stung once (fatally) under the neck, and carried by two pairs of legs. One nest contained twenty-six bees. The wasp never works in cloudy weather.

Occurs throughout the State. Specimens in the Experiment Station Collection at New Haven were taken from July to October, in the towns of New Haven, North Haven, Prospect, and Westbrook.

P. (P.) **sanbornii** Cresson.

Eyes of the male strongly converging above so they are separated from the lateral ocelli by about the width of one of the ocelli. Last dorsal plate of the male deeply emarginate. A large yellow spot on the front. The second dorsal segment with two large spots which nearly meet in the middle. Banks, *Bull. Amer. Mus. Nat. Hist.*, 1913, vol. 32, p. 423, has proposed the subgenus *Octoletes* for this and five other species.

Putnam, 12 July 1905 (H. L. V.); New Haven, 13 July, 1904, 30 June, 1905 (W. E. B., B. H. W.); Waterbury (W. H. P.).

P. (P.) **dubius** Cresson.

Eyes of the male not strongly converging above, separated from the lateral ocelli by a distance subequal to the length of the postocellar line. Last dorsal segment of the male entire. Second dorsal segment with a sinuate yellow band.

New Haven, 25 July, 1905 (W. E. B.); Hartford, 2 July, 6 August, 1893, 10 July, 1898, on *Roripa sylvestris* (S. N. D.).

P. (P.) **bilunatus** Cresson.

Easily recognized by the markings of the second dorsal segment and by being almost entirely impunctate. Scutellum not impressed. Dorsal aspect of propodeum with a shallow, depressed, median area.

North Haven, 3 August, 1905, Canterbury, 14 August, 1905 (B. H. W.); Hartford, 22 August, 1892 (S. N. D.).

P. (P.) solivagus Say. Howard, Insect Book, Pl. iii, Fig. 31.

Easily determined by the above table. There is a yellow spot between the bases of the antennæ, the scape of which is yellow in front. The metanotum is black. The markings are yellow.

Hartford (S. N. D.); Rockville (H. L. V.); Stafford (W. E. B.); New Haven, 24 August, 1906, on goldenrod (P.L.B.).

P. (P.) politus Say.

No free pale spot between the bases of the antennæ; metanotum pale. Markings whitish.

Poquonock, 27 June, 1905, on milkweed flower (H. L. V.).

TRYPOXYLONINÆ.

This subfamily is represented in the State by the genus *Trypoxylon* only. In some other parts of the Nearctic region are found the genus *Pison* and allies which belong to this subfamily.

Trypoxylon Latreille.

Elongate wasps, with the abdomen narrow and longer than the head and thorax; head transverse; inner margins of the eyes strongly emarginate within; radial cell of the fore wings pointed at the apex; one cubital and two discoidal cells sharply defined, the second cubital and third discoidal cells indicated by darkened lines. Black, or black marked with red.

These wasps are as a rule lazy when it comes to making a nest of their own, and usually choose a hole made by some other insect. The Peckhams record *rubrocinctum* as using holes made in the mortar of a brick wall, holes made in a post and in straw, the open ends of which were exposed. Other species choose nests made by other means, but *bidentatum* makes its own nest in stems of plants. Some of the species even use abandoned nests of the mud-daubers. When the nest is made in a burrow, the cells are separated by mud partitions, and the nest is sealed with mud. The Peckhams found that the species they studied used spiders only to provision their nests, but Ashmead records certain species as using aphids as food for their young. Ashmead also records one species, *T. collinum* Smith, as nesting in hard sand. If all these observations are proven to be correct, the genus will be one of very diversified habits. For a very pleasing account of *T. albopilosum* Fox and *T. rubrocinctum* Packard, see Peckham, Bull. 2, Wisconsin Geological and Natural History Survey, 1898, chapter viii, pp. 77-87. The species of this genus are parasitized by various species of Chrysididæ.

Key to Species.

1. Dorsal aspect of propodeum smooth or sparsely punctate.. 2
Dorsal aspect of propodeum striate, distinctly sculptured.. 3
2. Postocellar line slightly shorter than ocellocular line; wings dark, subviolaceous .... **politum**
Postocellar line very much longer than ocellocular line; wings subhyaline .... **excavatum**
3. Dorsal aspect of propodeum without a median sulcus 4
Dorsal aspect of propodeum with a median sulcus; small, opaque, black species 5
4. A strong projection between bases of antennæ; abdomen in part red .... **tridentatum**
No projection between bases of antennæ; abdomen black **clavatum**
5. Produced portion of clypeus truncate .... **frigidum**
Produced portion of clypeus strongly bidentate ...... **bidentatum**

T. politum Say. Howard, Insect Book, Pl. vi, Fig. 6.

This species has usually gone under the name *albitarse* Fabricius. The male was described by Kohl under the name *neglectum*. It is the largest species in the State, being about 18 mm. long, The posterior trochanters of the male are unarmed, but the first ventral abdominal segment has a hooked process. The habits of the species have been described by various authors, but under the name *albitarse*. The Raus have a good account of the habits of this species in *Jour. Animal Behavior,* 1916, vol. 6, no. 1.

Hartford, September and August.

T. excavatum Smith.

Length about 10 mm. Pubescence white, mesonotum smooth, shining. This species is said to occur from Jamaica to the New England States. It has been taken in the State, but no definite localities are available. It is said to nest in stems of *Syringa*.

T. clavatum Say.

Length about 14 mm. Pubescence white; hind tarsi partly pale; males with a spine on the hind trochanter. According to Ashmead this species uses the cells of *Chalybion cæruleum* for a nest, and it has been observed to nest in deserted holes in boards.

Has been taken in the State in July and August. Will perhaps be found only along the coast and in the river valleys. New Haven, 14 July, 1904 (W. E. B.).

T. tridentatum Packard.

Length about 8 mm. Pubescence white; males without a spine on the posterior trochanter; front with rather large, close punctures; ocelli separated from the inner margin of the eye by about their width.

This species has also been recorded from the State. Its general distribution is more southern, however, and it may also be restricted to the coast and river valleys.

T. frigidum Smith.

Length about 8 mm. Entirely black.

This is a northern species and has been taken at Branford, June 1905 (H. L. V.).

°**T. bidentatum** Fox.

Closely allied to *frigidum* and has a similar distribution, so will no doubt be found in the State.

MELLININÆ.

Mellinus Fabricius.

The habits of the American species of this genus have not as yet been worked out, but the European species, *M. arvensis*, nests in sand and provisions its nest with small Diptera, including *Stomoxys calcitrans* (the stable fly).

°**M. bimaculatus** Harris.

Not as yet taken in the State but no doubt occurs there. Length about 9 mm. Clypeus with a low produced portion which is sub-tridentate; third antennal joint very little longer than the fourth; head and thorax finely granular, opaque; abdomen shining; dorsal aspect of the propodeum with a U-shaped area. Black; inner margins of eyes, line on pronotum, two spots on the third dorsal segment, and legs in part yellow. Wings hyaline.

Sphecinæ.

The wasps of this subfamily are very easily recognized. The posterior orbits are usually much narrower than the diameter of the eye. The inner margins of the eyes are parallel or subparallel. The pronotum in all our species is transverse. The propodeum is long, with the spiracle placed about one fourth (or a greater distance) of the length of the propodeum from the metanotum. The abdomen is always petiolate. In some species the petiole is composed of the entire first and part of the second segment, so it is very long and has given these insects the common name "thread-waisted wasps." There are always three cubital cells in our species. The body is usually black with yellow or reddish markings, and is often clothed with hair. The antennæ are near the middle of the face. The clypeus is long and narrow dorsally.

The habits of these wasps are varied. Some of them nest in the ground, while others construct nests of mud and are often called mud-daubers. Some of them provision their nests with spiders, others with Lepidopterous larvæ, while still others use Orthopterous insects. For an interesting account of the habits of certain species see the Peckhams' book on Solitary Wasps.

Key to Tribes.

1. Second and third cubital cells each receiving a recurrent vein; propodeum without a U-shaped area on dorsal surface .... CHLORIONINI p. 678
Second cubital cell receiving both recurrent veins........... 2
2. Propodeum without a U-shaped dorsal area...... SPHECINI p. 680
Propodeum with a U-shaped dorsal area...... SCELIPHRONINI p. 682

CHLORIONINI.

Chlorion Latreille.

According to current views there is but one genus in the tribe Chlorionini. This genus, *Chlorion,* may be divided into a number of subgenera, the following of which occur within the limits of the State.

Key to Subgenera.

1. Second cubital cell wider than long 2
Second cubital cell longer than wide 3
2. Claws with one inner tooth .... **Chlorion** p. 679
Claws with three to six teeth .... **Prionony**x p. 679

3. Stigmatal groove wanting ....**Isodontia** p. 679
Stigmatal groove present ....'........**Ammobia** p. 680

Subgenus Chlorion Latreille (*s. str.*).

*C. (C.) **cyaneum** var. **ærarium** Patton.

Bronze- or purplish-blue. This beautiful form provisions its nest with crickets.

Type locality: Plainville, 30 August, 1871.

Subgenus Priononyx Dahlbom.

Key to Species.

Abdomen ferruginous or yellowish; male with sixth sternite broadly excavated on apical margin ....**bifoveolatum**
Abdomen dark brown or black; sixth sternite of male simple **atratum**

°C. (P.) **atratum** LePeletier, Howard, Insect Book, Pl. v, Fig. 20.

For notes on the habits of this species see "The Solitary Wasps," p. 171.

C. (P.) **bifoveolatum** Taschenberg. Howard, Insect Book, Pl. xi, Fig. 23.

Milford (George Dimmock).

Subgenus Isodontia Patton.

Key to Species.

1. Mandibles with two teeth ....**macrocephalum**
Mandibles with three teeth 2
2. Legs black ....**harrisi**
Legs more or less yellowish ....**auripes**

C. (I.) **auripes** Fernald.

This species, which has been taken at Branford, 19 September, 1904, by H. W. Winkley, is of southern distribution and will probably be restricted to the Carolinian area of the State.

°C. (I.) **macrocephalum** Fox.

C. (I.) **harrisi** Fernald. Howard, Insect Book, Pl. vii, Fig. 1.

This modest colored species will probably be found throughout the State; at present it is only known from New Haven, 13 July, 1904 (P. L. B.), 25 July, 1905 (W. E. B.).

Subgenus Ammobia Billberg.

Key to Species.

Abdomen and legs black; wings blackish ......pennsylvanicum
Abdomen in part and legs red or reddish; wings subhyaline
ichneumoneum

C. (A.) ichneumoneum Linnæus. Howard, Insect Book, Pl. v, Fig. 18.

For an interesting account of the habits of this species see chapter 2 of Peckhams' "The Solitary Wasps." The nests are provisioned with grasshoppers.

Common throughout the State, appearing in June and remaining until October, when it is a conspicuous visitor of the flowers of sumac, *Clematis, Asclepias,* mint and *Ceanothus.* Branford, Hartford, New Haven, and Stonington.

C. (A.) pennsylvanicum Linnæus. Howard, Insect Book, pl. vii, Fig. 20.

This species has been taken at New Haven but probably has a much wider distribution.

SPHECINI.

The wasps belonging to this tribe used to be, and by some still are, designated by the name *Ammophila.* Unfortunately it was necessary to sink the generic name *Ammophila,* and replace it by the Linnæan name *Sphex,* which had been previously used for the insects treated as *Chlorion,* subgenus *Ammobia,* in this report. The nomenclatural change is very unfortunate, but entirely unavoidable.

Sphex Linnæus.

This genus, as far as the forms in the region under consideration are concerned, may be divided into two subgenera on characters found in the abdomen. The species of North America are being revised by Dr. H. T. Fernald and it is very likely that a number of changes in the names will be made by this writer. In view of this forthcoming revision, the following table is adapted from "Synopsis of the North American Species of *Ammophila*" by A. L. Melander, with no changes or additional characters. This will probably necessitate fewer changes to accord with Fernald's revision. The species of this genus provision their nest with lepidopterous larvæ and are often useful in deying injurious insects belonging to this order. An interesting unt of *Sphex* and her caterpillars, with a number of figures, be found in Chapter i of Peckham's "The Solitary Wasps."

Key to Subgenera.

Petiole of abdomen part of first segment....**Psammophila** p. 681
Petiole of abdomen composed of entire first and part of second segment ....**Sphex** p. 681

Subgenus **Psammophila** Dahlbom.

Key to Species.

Body black or with a faint bluish tinge; mesonotum shining, transversely striate ....**luctuosa**
Abdomen partly reddish; mesonotum transversely striate; petiole extending beyond apex of hind trochanters .... **violaceipennis**

S. (P.) **luctuosa** Smith.

This and the following species will no doubt be found within State, but no positive date is available of their having been en there.

S. (P.) **violaceipennis** LePeletier.

Subgenus **Sphex** Linnæus (*s. str.*).

So far only one species has been recorded from the State, but ny more occur there, no doubt.

Key to Species.

Mesonotum with complete transverse striæ 2
Mesonotum punctate, smooth or incompletely transversely striate 3
Pleuræ with silvery spots; abdomen black ....**abbreviata**
Pleuræ with elongate silvery marks; abdomen in part red; dorsal aspect of propodeum with some oblique striæ..**procera**
Wings yellowish or fulvous; head and thorax with matted black pubescence, a spot of golden pubescence above bases of mid and hind coxæ ....**extrematata**
Wings not yellowish, subhyaline or darker 3
Pleuræ without pubescent markings..**extrematata** var. **pictipennis**
Pleuræ with pubescent markings 5
5. Mesonotum with appressed sericeous pubescence and erect hairs 6
Mesonotum without appressed pubescence but with erect hairs 7

6. Abdomen entirely black .... **abbreviata**
Abdomen in part red .... **arvensis**
7. Thorax clothed with cinereous pubescence; dorsal aspect of propodeum with oblique striæ from a median raised line **vulgaris**
Thorax without cinereous pubescence; mesonotum strigose or very closely punctate near sides .... **urnaria**

S. (S.) **abbreviata** Fabricius. Howard, Insect Book, Pl. vii, Fig. 9. Recorded from the State, but without definite locality.

°S. (S.) **arvensis** LePeletier.

°S. (S.) **extrematata** Cresson.

°S. (S.) **extrematata** var. **pictipennis** Walsh. Howard, Insect Book, Pl. vii, Fig. 7.

°S. (S.) **procera** Klug. Howard, Insect Book, Pl. v, Fig. 15.

°S. (S.) **urnaria** Klug.

S. (S.) **vulgaris** Cresson. Howard, Insect Book, Pl. vii, Fig. 5.

SCELIPHRONINI.

The members of this tribe are easily recognized by the U-shaped area on the dorsal aspect of the propodeum. They provision their nests, which are mud cells, with spiders. The species are common and are commonly called "mud-daubers."

Key to Genera.

Petiole scarcely longer than propodeum, metallic blue or violaceous .... **Chalybion** p. 682
Petiole about twice length of propodeum, black and yellow, not metallic .... **Sceliphron** p. 682

Chalybion Dahlbom.

C. **cæruleum** (Linnæus). Blue Mud Wasp. Howard Insect Book, Pl. v, Fig. 22 (as genus *Chlorion*).

This handsome, common species occurs throughout the State. It uses the following three species of *Epeira* most frequently as food for its young: *E. strix, E. vulgaris*, and *E. juniperi*. Berlin Branford, and New Haven.

Sceliphron Klug.

S. **cæmentarius** Drury. Mud-dauber. Howard, Insect Book, Pl. v, Fig. 14.

At present all eastern specimens, composed of variously marked forms, of the common black and yellow mud-dauber are considered to belong to this species, although a number of varietal names have been given. It occurs throughout the State. Branford, Colebrook, and New Haven.

LARRINÆ.

The insects of this subfamily nest in the ground, and provision their nests with Orthoptera. In the field they are active and often difficult to net. They may be separated into two tribes as follows:

Key to Tribes.

Posterior ocelli perfect; inner margins of eyes subparallel; pronotum trilobed dorsally....................LYRODINI p. 683
Posterior ocelli imperfect, flattened; inner margins of eyes strongly converging above; pronotum simple......LARRINI p. 684

LYRODINI.

This tribe is represented in our region by only the typical genus which may easily be recognized by the foregoing table.

Lyroda Say.

There are but three species of this genus known from the United States, and only two of these occur in the East, the third being known from the unique type which was collected in Colorado. The apical abdominal segments are clothed with pile. The female is without a tarsal comb.

Key to Species.

Wings very dark fuscous; dorsal aspect of propodeum without a longitudinal carina; clypeus of male not dentate laterally, of female bidentate..........................triloba
Wings hyaline, apex dusky; dorsal aspect of propodeum with a longitudinal carina; clypeus tridentate laterally......subita

L. triloba Say.

This species, which is larger than the following, is easily recognized.

Branford, 20 August, 1905 (H. W. W.).

L. subita Say. Howard, Insect Book, Pl. vi, Fig. 5.

This interesting, easily recognized little wasp feeds its young from day to day with crickets of the genus *Nemobius*. The nest is made in sand. The cricket is held, according to Packard, by the clasping of the base of the antennæ between the base of the mandibles and the clypeus. The minute teeth on the clypeus prevent the antennæ from slipping. When protecting its nest or when carrying prey the wasp appears nervous and agitated.

East Hartford, 9 August, 1904 (P. L. B.); New Haven, [illegible] August, 1906 (W. E. B.).

LARRINI.

These wasps are black or black and reddish and usually clothed with fine pile, which often forms transverse bands on the abdomen. They nest in the sand and as far as the records show seem to prefer the grasshoppers as food for their larvæ.

Key to Genera.

1. Front very strongly raised, so there is a transverse ridge below anterior ocellus; lateral ocelli linear; pygidium with silvery pile .... **Notogonidea** p. [illegible]
   Front not strongly raised, there being no transverse ridge below anterior ocellus 2
2. Lateral ocelli oval or elongate oval in outline; front not raised along inner margins of eyes; pygidium without pile **Tachysphex** p. [illegible]
   Lateral ocelli larger dorsally so they appear hooked....... 3
3. Front slightly raised along inner margins of eyes; pygidium without pile .... **Larropsis** p. [illegible]
   Front not raised along inner margins of eyes: pygidium clothed with pile .... **Tachytes** p. [illegible]

Notogonidea Rohwer.

°**N. argentata** (Beauvois).

Wings subhyaline, apical margin fuscous, body black; head, thorax and legs with silvery pile as are also the apical margins of the first to fourth dorsal abdominal segments. This common species, though it has not as yet been taken within the State, will surely be found there. According to Ashmead, it makes a [illegible] cell which it provisions with immature crickets.

Larropsis Patton.

L. distincta (Smith).

Wings subhyaline; abdomen black or black and red. Female, interorbital line less than the length of the second and third antennal joints; lateral anterior margin of the clypeus bidentate; first joint of the flagellum distinctly shorter than the second. Male: interorbital line less than the length of the second and third antennal joints; first joint of the flagellum one third shorter than the second.

Found throughout the State and has been taken on flowers of goldenrod and *Erechtites hieracifolium.*

Tachytes Panzer.

The wasps belonging to this genus are often very handsome with their silvery or golden markings on the black body. They nest in sand and provision their nest with grasshoppers. For an account of one species of this genus see "The Solitary Wasps," p. 167. Mr. Fox in his revision of the species of this genus divided them into two groups. All the species treated here belong to the first group, which is characterized as follows: "Fore coxæ of male simple, the fore femora of the same sex, beneath at base, entire; thorax of female generally densely pubescent. Appearance bee-like."

Key to Species.

1. Females 2
Males 6
2. Anterior margin of clypeus not produced into a lobe: abdomen black with three dorsal silver bands; longer spur of hind tibiæ subequal with the hind basitarsi; front golden .... **crassus**
Anterior margin of clypeus produced into a large quadrate tooth 3
3. Propodeum with a strong median sulcus, dorsally 4
Propodeum with at most a faint median sulcus, dorsally.. 5
4. Third joint of antennæ subequal in length with fourth; front and thorax with silvery gray pubescence .... **calcaratus**
Third antennal joint about one fourth longer than fourth; dorsal aspect of propodeum granular; thorax with grayish pubescence .... **harpax**
5. Pygidium with a coppery lustre; scutellum scarcely impressed; sulcus of propodeum very wide......... **mandibularis**
Pygidium silvery, scutellum distinctly impressed; sulcus of propodeum narrow .... **breviventris**
6. Basal joints of the flagellum not rounded out beneath; apical joints of antennæ normal; apex of femora, the tibiæ and tarsi yellow-ferruginous .... **crassus**

Basal joints of antennæ distinctly rounded out beneath; apical joints normal 7

7. Median anterior margin of clypeus produced into a lobe, which is strong but not tuberculate; dorsal aspect of propodeum distinctly sulcate..........................breviventris

Median anterior margin of clypeus not produced into a lobe 8

8. Last tergite tufted laterally with dark hair; head and thorax with golden pubescence; third and fourth antennal joints subequal; emargination of last sternite very narrow ..harpax

Last tergite not tufted laterally with black hair........... 9

9. Hind tarsi not spinose; lateral teeth of clypeus large and distinct ....mandibularis

Hind tarsi distinctly spinose; third antennal joint not shorter than second; abdomen black; longer spur of hind tibiæ longer than hind basitarsi ....calcaratus

T. breviventris Cresson.

Rockville, 23 August, 1905 (H. L. V.).

T. calcaratus Fox.

New Haven, 23 August, 1906 (P. L. B.).

°**T. crassus** Patton.

Probably confined to the coast and river valleys of the State.

T. harpax Patton.

Recorded from the State without definite locality, but will probably be found throughout the entire area.

°**T. mandibularis** Patton.

Probably the same distribution as *crassus*.

Tachysphex Kohl.

The species of the genus *Tachysphex* may be easily distinguished from the species belonging to the other genera which occur in the region covered by this report, by the characters given in the foregoing table. The species of this genus, like other members of Larrini, are sand-loving wasps and may often be found in abundance in some sandy place near a stream. In the experience of the writer the species of *Tachysphex* visit flowers less frequently than other members of the tribe Larrini. Only one species has as yet been taken within the State, but a number more will no doubt be found there when the Sphecoid fauna has been carefully exploited.

Key to Species.

Females	2
Males	6
Abdomen entirely red or red and black	3
Abdomen black or with only apical segments red	4
Dorsal aspect of the propodeum coarsely wrinkled	**quebecensis**
Dorsal aspect of propodeum granular	**tarsatus**
Interorbital line less than length of antennal joints three and four united	**acutus**
Interorbital line greater than or equal to length of third and fourth antennal joints	5
Dorsal aspect of propodeum granular; usually two apical abdominal segments red	**terminatus**
Dorsal aspect of propodeum strongly reticulate; usually only apical abdominal segment red	**apicalis**
Abdomen red or red and black	7
Abdomen black or with the apical segments red	8
Interorbital line subequal in length with third and fourth antennal joints; abdomen red; dorsal aspect of propodeum granular	**tarsatus**
Interorbital line less than length of third and fourth antennal joints; abdomen red and black; dorsal aspect of propodeum wrinkled	**quebecensis**
Abdomen ventrally rather strongly punctate; sides of propodeum coarsely striate	**apicalis**
Abdomen ventrally finely punctate; sides of propodeum finely striate	9
Front coarsely sculptured	**fuscus**
Front rather finely sculptured	**terminatus**

°**T. acutus** Patton.

T. apicalis Fox.

Poquonock, 27 June, 1905 (H. L. V.).

°**T. quebecensis** Provancher.

°**T. tarsatus** Say.

°**T. terminatus** Smith.

°**T. fuscus** Fox.

ASTATINÆ.

The wasps belonging to this subfamily are rather small, seldom more than 12 mm. in length. They are usually black or black and red. The eyes of the female converge but little toward the vertex, while the male is often holoptic. These little wasps nest in the ground and provision their nests with Homoptera.

For an account of the habits of our two species see Peckham, Bull. 2, Wisconsin Geol. and Nat. Hist. Surv., 1898, pp. 88-98.

Astata Latreille.

Key to Species.

Abdomen black .... **unicolor**
Abdomen red .... **bicolor**

A. unicolor Say.

Length about 10 mm.; third antennal joint longer than fourth; mesoscutum with small, well separated punctures; dorsal aspect of propodeum obliquely striato-reticulate; wings hyaline, fuscous apically.

A. bicolor Say.

Length about 9 mm.; third antennal joint but very little longer than fourth; dorsal aspect of propodeum reticulate; wings hyaline.

Both of the above species have been recorded from the State but no definite locality is known for either.

PEMPHREDONINÆ.

As treated here this subfamily includes genera which have heretofore been widely separated.

Key to Tribes.

Eyes small, their inner margins subparallel or converging to clypeus; head usually quadrate or subquadrate, well developed behind eyes; species shining; episternauli present except in *Spilomena;* usually nest in wood PEMPHREDONINI p. 688
Eyes large, their inner margins converging to vertex; head subtransverse, scarcely developed behind eyes; species opaque; episternauli wanting; nest in sand... MISCOPHINI p. 691

PEMPHREDONINI.

Key to Genera.

1. Anterior wings with only one recurrent vein 2
   Anterior wings with two recurrent veins 3
2. Abdomen with a distinct petiole; episternauli present.... **Stigmus** p. 689
   Abdomen without a petiole; episternauli wanting........ **Spilomena** p. 689
3. Abdomen sessile .... **Passaloecus** p. 689
   Abdomen petiolate .... **Pemphredon** p. 690

Stigmus Panzer.

The species of this genus are small, active, black wasps which provision their nests, which are made in stems, or stumps, with aphids. The only species found within the limits of the State may be characterized as follows:

S. americanus Packard.

Head seen from above nearly quadrate; ocelloccipital line three or more times as long as the postocellar line; upper lateral margin of the pronotum not dentate; sides of the pronotum dentate; pygidium subequal in length with the basal width.

New Haven, 3 July, 1904; Momaguin, 5 August, 1905 (W. E. B.). Bred from *Rhus* sp., collected, New Haven, 24 January, 1911 (A. B. C., B. H. W.). This species is preyed upon by *Omalus corruscans*.

Spilomena Shuckard.

The habits of the species of this genus are probably similar to those of the genus *Stigmus*. Only one species is known to occur in the eastern United States.

S. pusilla Say.

Black with testaceous legs.

Waterbury; Branford, 11 August, 1904 (H. L. V.).

Passalœcus Shuckard.

As far as known the species of this genus make their nests in rotten wood, decaying bark, in the galleries of wood-boring insects, or in hollow stems of plants, and provision the same with aphids or other small insects. According to observations made by Westwood, two of the European species carry the aphids used in provisioning their nests, with their mandibles. Only one species has as yet been found in the State.

P. annulatus Say.

Third antennal joint subequal with (female) or much shorter than (male) the fourth; the impressed lines on the mesoscutum strongly foveolate; antennæ of the male rounded out beneath, long, slender. Black; scape beneath, mandibles (except apices), tubercules and male flagellum beneath, white or yellowish white; part of femora, all the tibiæ and tarsi testaceous.

New Haven, 26 June, 1905, on pear tree (H. L. V.). Has been recorded as nesting in the bark of pine trees, lining its nest with clay.

Pemphredon Latreille.

As far as known the habits of the species of the genus *Pemphredon* conform in the main with those of the genus *Passaloecus*, but according to the records known at present the members of the former genus prefer decaying wood for places to make their nests. They also use aphids as the food for their larvae.

The species falling in this genus may be divided into subgenera, but for the purpose of this paper the division is unnecessary for the small number of species known to occur in Connecticut.

Key to Species.

1. First cubital cell receiving only one recurrent vein; mesoscutum with strong transverse wrinkles 2
   First cubital cell receiving both recurrent veins 3
2. Petiole nearly as long as first two joints of hind tarsi; anterior margin of clypeus, in female, subtruncate in middle; head of male much narrowed behind, not twice as broad as median length .... concolor
   Petiole subequal in length with first joint of hind tarsi; anterior margin of clypeus, in female, angulate in middle; head of male not much narrowed behind, fully twice as long as median length .... angularis
3. Mesoscutum of female with large, very close punctures; head of male very transverse, twice as broad as median length inornatus
   Mesoscutum of female with large, widely separated punctures; head of male nearly quadrate, not nearly twice as broad as median length .... tenax

P. inornatus Say.

North Haven, 3 August, 1905 (H. L. V.).

P. tenax Fox.

North Haven, 3 August, 1905 (H. L. V.).

°**P. concolor** Say.

The male of this and the following species have the flagellum simple, the propodeal enclosure rugose, and the clypeus with a wide emargination.

°**P. angularis** Fox.

MISCOPHINI.

This tribe is represented in the eastern United States by the genus *Plenoculus*.

Plenoculus Fox.

P. atlanticus Viereck.

Male: length 4.5 mm. Inner margins of the eyes distinctly diverging below; anterior margin of the clypeus rounded, with two widely separated teeth near the middle; median furrow distinct; ocelli in an acute triangle, the postocellar line subequal to the ocellocular line; antennæ rather short, the third, fourth and fifth joints subequal in length; head and thorax dull, finely closely punctate; dorsal aspect of the propodeum finely transversely striate, with a median longitudinal furrow; sides of the propodeum obliquely striato-granular; abdomen dull, finely granular, the apex of the three basal segments narrowly depressed. Black; clypeus, mandibles (except piceous apices), scape in front, tubercules, tegulæ, femora beneath toward apex, and all the tibiæ and tarsi yellow. Wings hyaline, iridescent; venation brown.

Poquonock, 27 June, 1905 (H. L. V.).

BEMBECIDÆ.

In the absence of the prepectus the wasps of this family resemble most of the Apoidea.

The family Bembecidæ of the present classification is the Bembecidæ and Stizidæ of Ashmead's arrangement or the "Gattungsgruppe" *Bembex* of Kohl's system. The wasps belonging to this family have a habitus of their own and are easily distinguished from all other wasps by the characters used in the table. They are smooth-bodied and have a transverse head. There are always three cubital cells, the second of which receives both the recurrent veins and in all our species is broad on the radius.

These wasps nest in the ground and provision their nests with Diptera or in one case Homoptera. Often they nest in colonies in sunny, sandy places, although many of the species are solitaray in their nesting habits and often very shy. Some of the shyer species are very difficult to catch and offer good sport.

The family may be divided into two well defined, but allied subfamilies. The following characters will serve to separate these groups:

Key to Subfamilies.

Labrum small, very much shorter than the dorso-ventral length of clypeus; intermediate tibiæ with two apical spurs STIZINÆ p. 692

Labrum very large, often longer than the dorso-ventral length of clypeus; intermediate tibiæ with one apical spur BEMBECINÆ p. 692

STIZINÆ.

This subfamily is represented in the State by a single species.

Sphecius Dahlbom.

S. speciosus (Drury). Giant Sand Wasp. Pl. viii, Fig. 15. Howard, Insect Book, Pl. v, Fig. 21; Figs. 7-12.

This is the largest Sphecoid known from the eastern United States. It is large, robust, often more than 30 mm. long. It may be briefly described as follows: Eyes slightly converging toward the clypeus; facial quadrangle narrow, at the antennæ the width is not as great as the diameter of the eye at the same place; ocelli in a low triangle, the anterior one the largest; flagellum thickened apically; posterior calcaria flat, the longer one strongly curved. Black; clypeus, a spot above labrum, mandibles (except piceous apices), scape, spot on inner orbits, line on pronotum, tubercules, and spots on the first three abdominal segments, yellow; scutellum, and mesoscutum sometimes, rufous; wings yellowish hyaline, venation ferruginous.

This species has often been called "the Cicada-killer" because it preys on Cicadæ. Ashmead records it as provisioning its nest, which is in sand, with the following: *Cicada dorsata*, *C. tibicen* and *C. marginata*. The original account of the habits of this interesting species was published by Riley in "Insect Life," Vol. 4, p. 248, Figs. 32-38.

On record from New Haven, August, 1905, and has been taken by F. Knab at Milford on 15 August, 1900. The species is sometimes very common locally, and often plays an important rôle in the reduction of Cicadæ. Other species of this genus occur in the Western States.

BEMBECINÆ.

Key to Genera

1. Mandibles simple; maxillary palpi 3-jointed, labial palpi 1-jointed .... **Microbembex** p. 693

Mandibles armed with a tooth within; palpi different...... 2

2. Propodeum emarginate posteriorly .... **Bembidula** p. 693
Propodeum not emarginate posteriorly, straight or convex .. 3
3. Anterior ocellus round or reniform; maxillary palpi 6-jointed, labial palpi 4-jointed .... **Stictia**
Anterior ocellus linear; maxillary palpi 4-jointed, labial palpi 2-jointed .... **Bembex** p. 694

Microbembex Patton.

M. monodonta (Say).

Under this name a number of distinct forms have been grouped. The species has been recorded from the State and has been taken in July and August. At present it is impossible to tell to which form the record applies. The true *monodonta* is black with greenish-white markings; the pleuræ black, and mesoscutum also; the wings are slightly dusky.

Nothing has been published on the habits of these wasps. Some of the western forms appear to nest in colonies, while it seems probable that the eastern *monodonta*, nests singly or in very small colonies.

Bembidula Burmeister.

This genus is readily separated from the other genera of Bembecinæ by the emarginate propodeum. The maxillary palpi are 6-jointed, the labial palpi 4-jointed. The anterior ocellus is linear or transverse and curved. The habits of our species have as yet not been worked out.

Key to Species.

Length about 18 mm.; metanotum black; abdominal spots much wider at the sides .... **quadrifasciata**
Length about 14 mm.; metanotum with yellow spots; abdominal spots not, or but very slightly, wider at sides ... **ventralis**

°**B. quadrifasciata** Say.

Last dorsal abdominal segment of the female is ridged laterally; intermediate femora of the male simple.

This species is widely distributed and should occur in the State.

B. ventralis Say.

Last dorsal abdominal segment of the female is not ridged laterally; the intermediate femora of the male are produced into a tooth beneath.

This species is rather common locally. It has been taken at New Haven and Salisbury in July and August.

Bembex Fabricius.

B. spinolæ LePeletier. Pl. x, Fig. 4; Howard, Insect Book, Pl. i, Fig. 24.

Length about 16 mm. Labrum not depressed basally; in the male the intermediate tarsi are longer than their tibiæ, and the seventh ventral segment is normal. Black; clypeus, spot above labrum, mandibles (except piceous apices), scape in front, spot on inner orbits, line on pronotum, tubercules, tegulæ, and legs below the middle of the femora, yellow; bands on the first abdominal segments (slightly interrupted in the middle of the first segment, and wavy on the following segments) greenish-white; wings clear hyaline, venation pale brown. For an interesting account of the habits of this species see Chapter vi of Peckham's "Solitary Wasps."

New Haven (W. E. B., B. H. W.); Plainfield, 14 August, 1905 (B. H. W.); Poquonock, 27 June, 1905 (H. L. V.).

CERCERIDÆ.

The species belonging to this family have usually been placed with the Philanthinæ. Dr. Ashmead separated them as a distinct subfamily, but left them close to *Philanthus*. The absence of the prepectus in *Cerceris* easily separates it from *Philanthus* or any of the Philanthinæ. In the thorax, especially the mesothorax, *Cerceris* recalls bees of the genus *Nomada*.

The wasps belonging to the genus *Cerceris* make solitary nests in the ground which they provision with beetles. Some of the American species are known to prey on injurious weevils and are therefore beneficial. According to the Peckhams, the species of *Cerceris* are very shy, and difficult to study. For an interesting account of the habits of three of our species the reader is referred to Chapter xi, "Some Grave Diggers," of Peckham's "Solitary Wasps."

Mr. Nathan Banks has recently tabulated the species of the eastern United States and described a number of new ones. The following table is adapted from the one given by Mr. Banks.

Cerceris Latreille.

Key to Species.

1. Males 2
Females 9

2. Hind femora pale at base and black at apex 3
Hind femora black, pale, or black at base and pale at apex 6

3. Propodeal enclosure broad, almost entirely smooth; lateral spots on first segment of abdomen; clypeus swollen out transversely above middle ....**fasciola**
Propodeal enclosure striate 4

4. Clypeus flat, broadly truncate in front, with a transverse depression before apex; face only slightly hairy; first dorsal abdominal segment with spots; last ventral segment only slightly emarginate at tip ....**deserta**
Clypeus convex, rather rounded below and with no transverse depression before apex 5

5. Enclosure finely evenly striate; abdomen very slender, first segment narrow; usually but four or five teeth above on hind tibia ....**imitatoria**
Enclosure more coarsely striate; abdomen broader, more coarsely punctate; six to eight teeth above on hind tibia **clypeata**

6. Scutellum not pale, but metanotum yellow; wings black.... **fumipennis**
Scutellum marked with pale; wings hyaline or subhyaline.. 7

7. A tooth or a ridge on each side of mesosternum; hind femora black; no stripes on propodeum ....**compar**
No tooth or ridge on mesosternum.................... 8

8. Metanotum black; apical joint of antennæ longer than preceding, and concave within at tip ....**robertsoni**
Metanotum yellow; apical joint of antennæ subequal with preceding ....**compacta**

9. Clypeus more or less swollen, but without an elevation with a free apical edge 10
Clypeus with an elevation or process which has a free apical edge 11

10. Wings black; abdomen with exception of second segment (in part) black ....**fumipennis**
Wings subhyaline; abdominal segments with pale bands... **fulvipediculata**

11. Clypeal process erect and as long as broad....................**clypeata**
Clypeal process broader than long or not erect.................... 12

12. A lamella from tip of clypeal process.................... 13
No lamella from tip of clypeal process.................... 14

13. Clypeal lamellæ small, not half the width of the process **robertsoni**

Clypeal lamellæ large, extending nearly the entire width of the process .... **compacta**

14. Scutellum yellow; clypeal process small .... **compar**

Scutellum black; metanotum yellow 15

15. Yellow spot on base of mandibles; clypeal process broad, emarginate interiorly; hind femora black apically .... **fasciola**

Mandibles black 16

16. Clypeal process deeply emarginate, angles strongly produced; propodeal enclosure finely striate; spots on first tergite connate .... **dentifrons**

Clypeal process not or only slightly emarginate apically.... 17

17. Clypeal process not emarginate; stigma yellowish; propodeal enclosure mostly smooth .... **deserta**

Clypeal process slightly emarginate; stigma brown, propodeal enclosure finely striate .... **arelate**

°**C. arelate** Banks.

This species has been taken in New Hampshire and Virginia and will probably be found within the region covered by this report.

C. clypeata Dahlbom. Howard, Insect Book, Pl. i, Fig. 14.

Has been taken at Branford, New Haven, and Hartford from June to August.

°**C. compacta** Cresson. Howard, Insect Book, Pl. iii, Fig. 34.

C. compar Cresson.

Occurs throughout the State and has been taken in New Haven on flowers of New Jersey tea and in Scotland on *Spiræa salicifolia;* also, Putnam, 12 July, 1905 (H. L. V.).

C. dentifrons Cresson.

Hartford, 15 September, 1895 (S. N. D.); Stonington, 26 July, 1906 (J. A. Hyslop); Lyme, 28 August, 1910 (A. B. C.).

C. deserta Say.

New Haven, 27 June, 1902 (E. J. S. M.), 16 August, 1904 (B. H. W.); 14 August, 1906 (P. L. B.).

C. fasciola Cresson.

Rockville, 23 August, 1905 (H. L. V.).

C. fulvipediculata Schletterer. *C. fulvipes* Cresson.

Hartford, 3 September, 1892, New Haven (S. N. D.), 16 August, 1904 (B. H. W.).

°**C. fumipennis** Say

C. imitatoria Schletterer. *C. imitator* Cresson.

Occurs throughout the State, and has been taken at New Haven, Colebrook, Putnam, Scotland and Thompson, in June and July.

C. robertsoni Fox.

Hartford, 30 July, 1893 (S. N. D.).

APOIDEA.*

To this superfamily belong insects like the honey-bee, the habits of which are quite diverse, as can be seen by a perusal of the remarks under the family headings in the following pages.

Key to Families.

1. Females and most males with a flat triangular area on apical dorsal abdominal segment 2

Females and most males without a flat triangular area on apical dorsal abdominal segment 10

2. Clypeus hardly protuberant, and mandibles not commonly beveled; labrum concealed except at base, and provided with a basal process or raised area; posterior angle of mandible not in front of posterior margin of eye; metathorax produced beyond postscutel, in profile at least strongly convex, usually with a posterior and a dorsal space; tongue acute, flat, rarely filiform; labial palpi with first joint varying in size and shape but with second, third, and fourth joints simple 3

Clypeus protuberant, or mandibles beveled so as to show all of labrum or a great portion of it; labrum large, without a basal process; posterior angle of mandible before posterior line of eye; thorax in profile declining beyond scutel; postscutel on posterior face of thorax, metathorax at most a little convex; tongue filiform; first and second joints of labial palpi flat 7

3. Labrum not free from mandibles and not as large as clypeus 4

Labrum free from mandibles and as large as clypeus...... DUFOUREIDÆ p. 720

4. Hind metatarsus invariably narrower than tibia 5

Hind tibia and metatarsus of equal breadth.............. MACROPIDÆ p. 720

5. Marginal cell acute toward front edge of wing............. 6

Marginal cell truncate toward front edge of wing........ PANURGIDÆ p. 721

6. Basal vein forming more or less perfectly an arc of a circle; face with no pubescent depressions or foveæ............ HALICTIDÆ p. 699

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* The classification here adopted is a modification of Charles Robertson's admirable classification of the bees of Carlinville, Illinois.

Basal vein forming a more or less perfectly straight line; face with pubescent depressions or foveæ, at least in female ....ANDRENIDÆ p. 709

7. First portion of subdiscoidal vein distinctly longer than third portion of discoidal vein 8

First portion of subdiscoidal vein shorter than third portion of discoidal vein ....NOMADIDÆ p. 722

8. Marginal cell bent away from costal vein 9

Marginal cell not bent away from costal vein............ ANTHOPHORIDÆ p. 735

9. Vertex crested ....EUCERIDÆ p. 730

Vertex not crested ....EMPHORIDÆ p. 734

10. Second recurrent vein bent or directed outward before joining first portion of subdiscoidal vein; tongue flat, bilobed; depressions or foveæ on face 11

Second recurrent vein never strongly bent or directed outward before joining first portion of subdiscoidal vein; tongue filiform; no depressions or foveæ on face........ 12

11. Wings with two closed submarginal cells; black with yellow markings ....HYLÆIDÆ p. 737

Wings with three closed submarginal cells; black without yellow markings ....COLLETIDÆ p. 739

12. Wings with two submarginal cells 13

Wings with three submarginal cells 14

13. Claws cleft, inner tooth subapical ....STELIDIDÆ p. 741

Claws simple, or in some species with a basal tooth........ MEGACHILIDÆ p. 741

14. Apex of sixth dorsal abdominal segment in female with a spine 15

Apex of sixth dorsal abdominal segment in female without a spine; first submarginal cell shorter than second; cheek or malar space distinct ....APIDÆ p. 754

15. First submarginal cell longer than second, and as long as third ....CERATINIDÆ p. 753

First submarginal cell shorter than second................ XYLOCOPIDÆ p. 753

HALICTIDÆ.

To this division of bees belong what are known as sweat-bees. They range in color from stramineous to black, and some have metallic blue, green, brassy, or coppery hues; others have more or less red or yellow in the ground color or markings. In size each species is quite constant within certain limits. The largest species is hardly more than 12 mm. in length, and the smallest scarcely less than 5 mm.

Key to Genera.

Females.

1. Veins of front wings, beyond first recurrent vein, not obsolescent, but distinct like other veins ....
   Veins of front wings, beyond first recurrent vein, obsolescent Halictus p. 7
2. Labrum flat, ciliate; rima on fifth abdominal segment absent Sphecodes p. 7
   Labrum produced at apex, laterally compressed, pectinate; rima present ....Halictus p. 7

Males.

1. Abdominal segments without apical pubescent fasciæ ....
   Abdominal segments with apical pubescent fasciæ........ Halictus p. 7
2. Head and thorax black ....
   Head and thorax not black ....Halictus p. 7
3. Clypeus black, rather densely pubescent ......Sphecodes p. 7
   Clypeus with a yellowish mark anteriorly, or black and thinly pubescent ....Halictus p. 7

Halictus Latreille.

Key to Species.

Females.

1. Veins of fore wing beyond first recurrent vein distinct like other veins; labrum produced at apex and laterally compressed, pectinate; rima present on fifth abdominal segment ....
   Veins of fore wing beyond first recurrent vein, or some of them, obsolescent ....
2. Bright golden green; segments of abdomen with basal pubescent fasciæ or without fasciæ ....
   Black or dull greenish; segments of abdomen with apical pubescent fasciæ ....
3. Propodeum not truncate along posterior margin or subquadrately truncate ....
   Propodeum circularly truncate along posterior margin......
4. Hind spur of hind tibia finely serrate; hind knee-plate present
   Hind spur of hind tibia with four to six teeth; hind knee-plate absent; second abdominal segment shining, sparsely punctate, hardly ciliate ....viridissimus
5. Fore wings with second cubital vein absent or obsolescent..
   Fore wings with second cubital vein neither absent nor obsolescent; propodeum rounded posteriorly, without a distinct posterior face; clypeus produced, mesonotum and propodeum smooth and lusterless ....coriaceus

6. Dull greenish or bluish; second cubital vein present 7

Black 14

7. Mandibles dentate; cheeks rounded behind 19

Mandibles simple; cheeks with a rounded angle behind, a little above middle of eye .... **cephalicus**

8. Black, sometimes inclining to reddish; hind spur of hind tibiæ with about six to eight teeth 9

Dull greenish; hind spur of hind tibiæ with four or five teeth **provancheri**

9. Cheek produced into a strong tooth-like angle posteriorly **ligatus**

Cheek rounded, not so produced .... **lerouxi**

10. Abdomen green; mesonotum, with practically all of its punctures of the same size 11

Abdomen black .... **virescens**

11. Propodeum strongly rugose longitudinally, without an enclosure .... **radiatus**

Propodeum coarsely reticulated, with a finely rugose triangular space where joined to thorax proper .... **splendens**

12. Sides of mesonotum reticulated 13

Sides of mesonotum not reticulated .... **purus**

13. Larger, greener; antennæ, tegulæ and legs darker; hind tibiæ mostly dark, blackish .... **confusus**

Smaller, more brassy; antennæ, tegulæ and legs paler; hind tibiæ almost entirely stramineous .... **persimilis**

14. Abdomen without, or with interrupted, pubescent fasciæ.... 15

Abdomen with continuous pubescent fasciæ; hind spur of hind tibiæ with four or five distinct teeth 16

15. Propodeum sharply truncate along its rear margin; hind spur of hind tibiæ with long distinct teeth; first abdominal segment not punctate .... **truncatus**

Propodeum slightly rounded along its rear margin; hind spur of hind tibiæ with less distinct, more oblique, and sharper teeth than in *truncatus*; first abdominal segment finely punctate .... **arcuatus**

16. Propodeum without an enclosed space 17

Propodeum with an enclosed space 18

17. Propodeum densely pubescent; enclosure bare and subtriangular .... **nelumbonis**

Propodeum bare or nearly so; enclosure semicircular..**pectoralis**

18. White pubescent patches on each side of second, third, and fourth abdominal segments .... **quadrimaculatus**

No white pubescent patches on abdominal segments........ **foxi**

19. Tegulæ punctate 20

Tegulæ not punctate 21

20. Propodeum sharply truncate behind and with a sharp edge; wing whitish .... **nymphæarum**
Propodeum hardly truncate, with a blunt edge........ **tegularis**

21. Abdomen not metallic 25
Abdomen metallic, greenish or bluish 27

22. Mesonotum shining; head not distinctly longer than broad.. 23
Mesonotum lusterless; head distinctly longer then broad 24

23. Dark blue .... **cæruleus**
Brassy green .... **zephyrus**

24. Wings and pubescence yellowish .... **pilosus**
Wings and pubescence whitish .... **pruinosus**

25. Mesonotum rather coarsely punctate 26
Mesonotum rather finely punctate; head hardly longer than broad 27

26. Wings and veins whitish .... **albipennis**
Wings and veins not whitish .... **cressoni**

27. Abdomen dark 28
Abdomen yellowish stramineous .... **vierecki**

28. Abdomen more oval, more densely pubescent, the hairs less appressed; upper surface of propodeum not bordered by a raised line 29
Abdomen obovate; first and second segments shining, third, fourth, and fifth covered with sparse, closely appressed hairs .... **sparsus**

29. Abdomen blacker; third, fourth, and fifth dorsal abdominal segments less pubescent; raised lines of upper surface of propodeum not reaching rear margin but falling far short thereof .... **obscurus**
Abdomen brown; third, fourth, and fifth dorsal abdominal segments closely pubescent .... **versatus**

Males.

1. Abdominal segments without apical pubescent fasciæ...... 2
Abdominal segments with apical pubescent fasciæ 8

2. Head and thorax neither dull greenish nor bluish 3
Head and thorax dull greenish or bluish; fourth antennal joint as long as second and third combined, or nearly so; second cubital vein present 7

3. Head and thorax bright golden green 5
Head and thorax black; clypeus anteriorly with a yellowish mark, or black and thinly pubescent 4

4. Fourth antennal joint slightly shorter than second and third together; face subquadrate, apex of one mandible reaching to base of its fellow; tarsi dark .... **coriaceus**
Fourth antennal joint longer than second and third together, or only slightly longer than third 14

5. Abdomen colored like head and thorax 6
Abdomen black with yellow bands 10

6. Ventral abdominal segments not rigid or retracted, dark, except sometimes middle ones; tibiæ pale, at least at base and apex 12
First three ventral abdominal segments rigid, bright green, others dark, retracted; tibiæ green; second abdominal segment shining, sparsely punctate, hardly ciliate ...**virdissimus**
7. Clypeus convex 19
Clypeus flat ....**cephalicus**
8. Body black; femora black 9
Body dull greenish; legs yellow ....**provancheri**
9. Flagel entirely black ....**lerouxi**
Flagel black above, yellow beneath ....**ligatus**
10. Abdomen with six yellow bands 11
Abdomen with five yellow bands; fourth ventral abdominal segment entire ....**virescens**
11. Hind metatarsi carinate; base of abdomen reddish in middle **splendens**
Hind metatarsi not carinate; base of abdomen black in middle **radiatus**
12. Fourth ventral abdominal segment emarginate, not greenish 13
Fourth ventral abdominal segment not emarginate, greenish **purus**
13. Body green, tibiæ mostly dark ....**confusus**
Body brassy, tibiæ almost entirely stramineous ....**persimilis**
14. Fourth antennal joint hardly longer than third 15
Fourth antennal joint longer than second and third combined 17
15. Anterior portion of clypeus dark; legs entirely dark...... 16
Anterior portion of clypeus whitish; legs partly whitish.... **quadrimaculatus**
16. Propodeal enclosure semicircular ....**pectoralis**
Propodeal enclosure triangular ....**nelumbonis**
17. Propodeum coarsely rugose 18
Propodeum finely rugose ....**foxi**
18. First dorsal abdominal segment distinctly punctate.....**arcuatus**
First dorsal abdominal segment almost impunctate....**truncatus**
19. Tegulæ punctate 20
Tegulæ not punctate 21
20. Propodeal enclosure semicircular; wings whitish..**nymphæarum**
Propodeal enclosure wanting; wings not whitish.......**tegularis**
21. Abdomen greenish or bluish 22
Abdomen neither greenish nor bluish 26
22. Mesonotum finely rugose, not shining, closely punctate.. 23
Mesonotum smooth and shining, finely and sparsely punctate; facial line hardly longer than transfacial line 25
23. Facial line much longer than transfacial line; apex of clypeus usually yellowish; abdomen distinctly greenish 24

Facial line slightly longer than transfacial line; clypeus not yellowish; abdomen with only a slight greenish tinge.. **versatus**

24. Pubescence above and veins and stigma yellowish....... **pilosus**

Pubescence above and veins and stigma whitish .... **pruinosus**

25. Dark blue .... **caeruleus**

Greenish .... **zephyrus**

26. Abdomen not stramineous; tibiæ black except often at base and apex; sides of propodeum and pleuræ not distinctly punctate; facial line not or hardly longer than transfacial line 27

Abdomen and tibiæ almost entirely stramineous........ **vierecki**

27. Mesonotum coarsely punctate 28

Mesonotum finely punctate 29

28. Wings whitish, veins and stigma whitish .... **albipennis**

Wings not whitish; propodeum coarsely reticulated, semicircular enclosure bordered by a sharp edge .... **cressoni**

29. Mesonotum not shining 30

Mesonotum shining .... **sparsus**

30. Veins and stigma dark .... **obscurus**

Veins and stigma pale .... **versatus**

H. (Halictus) provancheri Dalla Torre.

Occurs throughout the State, and has been taken at New Haven, Poquonock, Sachem's Head, Scotland, and Stonington, in May, June, July, August, and October. Visits the flowers of New Jersey tea (*Ceanothus americanus*) and goldenrod (*Solidago*), quince, and strawberry.

H. (H.) ligatus Say.

Has been taken in Branford, Milldale, New Haven, Prospect, Sachem's Head, Salisbury, and Scotland, in May, June, July, August, and October. Visits goldenrod flowers, etc.

H. (H.) lerouxi LePeletier. Pl. x, Fig. 7; Howard, Insect Book, Pl. iii, Fig. 6.

This species has been taken near the coast at Branford, New Haven, Sachem's Head, and Westbrook, in May, June, and July, and at Prospect in August. Visits gooseberry flowers.

H. (Agapostemon) virescens Fabricius. *H. viridulus* Authors.

Occurs all over the State, and has been taken at Branford, New Haven, North Haven, Mt. Carmel, and Prospect, in June, August, and October.

H. (A.) **radiatus** Say. Howard, Insect Book, Pl. iii, Fig. 11.

This species may be found everywhere in the State, and has been taken at Branford, New Haven, Mt. Carmel, and Stafford, in May, June, July, and August. It visits the flowers of goldenrod, New Jersey tea, etc.

H. (A.) **splendens** LePeletier. Howard, Insect Book, Pl. iii, Fig. 14.

This species occurs probably only in the Carolinian region of Connecticut.

H. (Augochlora) **viridissimus** Viereck.

Occurs throughout the State and has been taken in June and August visiting flowers of milkweed and sumac (*Rhus glabra*). Branford, 12 August, 1904; Poquonock, 27 June, 1905 (H. L. V.).

H. (Oxystoglossa) **purus** (Say). *Augochlora pura* Say.

Branford, 22 August, 1904 (H. W. W.).

H. (O.) **confusus** (Robertson).

Branford, 22 August, 1904 (H.W.W.).

H. (O.) **persimilis** Viereck. *H. similis* Robertson, not Smith.

First record for Connecticut, New Haven, 7 May, 1904 (H.L.V.), visiting flowers of sweet cherry, Japan plum, black currant and gooseberry.

H. (Lasioglossum) **coriaceus** Smith.

Occurs throughout the State and has been taken in Branford, Colebrook, New Haven, Stonington, and Westbrook, in May, June, July, and August.

H. (Evylæus) **truncatus** Robertson.

Generally distributed throughout the commonwealth, and has been taken in Branford, Colebrook, New Haven, Rockville, and Scotland, in May, July, and August; visits flowers of *Cicuta maculata*, black currant and Japan plum.

H. (E.) **arcuatus** Robertson.

Occurs throughout the State, and has been taken at New Haven, Prospect, Stonington, and Torrington, in May, June, July, and August. It visits the flowers of the goldenrod, gooseberry, black currant, Japan plum and *Prunus avium*.

°H. (E.) **nelumbonis** Robertson.

H. (E.) **pectoralis** Smith.

Is a species that has been seen only at Colebrook, where the writer captured a specimen visiting the flowers of *Cicuta maculata*, 21 July, 1905.

H. (E.) **quadrimaculatus** Robertson.

Can be found all over Connecticut and has been taken at Branford, Mt. Carmel, New Haven, Sachem's Head, and Scotland, in May, June, and August.

H. (E.) **foxi** Robertson.

First record for Connecticut, Sachem's Head, Guilford, 1 August, 1904 (H. L. V.).

H. (Chloralictus) **nymphaearum** Robertson.

Has been taken at Branford, East Hartford, New Haven, North Haven, Orange, Putnam, Sachem's Head, Salisbury, Saybrook, and Scotland in June, July, and August. It visits the flowers of goldenrod.

H. (C.) **tegularis** Robertson.

First record from Connecticut, New Haven, 22 May, 1905 (B. H. W.).

H. (C.) **pilosus** Smith.

Occurs throughout the State, and has been taken at Branford, Canterbury, East Hartford, New Haven, Putnam, Sachem's Head, Salisbury, Scotland, and Stonington, in May, July, and August. It visits the flowers of the gooseberry and sweet cherry.

°H. (C.) **pruinosus** Robertson.

H. (C.) **cæruleus** Robertson.

Has not been taken outside of the Carolinian region of the State. New Haven, 16 October, 1903, Branford, 11 August, 1904 (H. L. V.); East Hartford, 9 August, 1904 (B. H. W.).

H. (C.) **zephyrus** Smith.

Is on record from localities representing the entire State, and has been captured at Branford, East Hartford, New Haven, Putnam, Sachem's Head, and West Hartford, in May, June, July, and August. It visits the flowers of the red currant, black currant, sweet cherry, and apple, and is of economic importance because like others of its congeners it causes fruit to set by transmitting pollen from flower to flower in its quest after pollen and nectar.

H. (C.) **albipennis** Robertson.

First record from Connecticut, New Haven, 17 June, 1905 (H. L. V.).

H. (C.) **cressoni** Robertson.

Is on record from localities representing the entire State, and has been taken at Branford, New Haven, Putnam, and Scotland, in June, July, August, and September.

H. (C.) **vierecki** Crawford.

New Haven, 24 May 1904, 25 July 1905 (W.E.B.); Putnam, 12 July, 1905 (H. L. V.).

H. (C.) **sparsus** Robertson.

Occurs all over the State, and has been taken at Branford, Brookfield, Cheshire, New Haven, Poquonock, Prospect, Putnam, Sachem's Head, Scotland, Stonington, and West Hartford, from May until September. It is one of the most common visitors of the early spring fruit blossoms, visiting in Connecticut especially the gooseberry (in great numbers), black currant, Japan plum (in great numbers), *Prunus avium*, peach, apple, pear, and quince.

H. (C.) **obscurus** Robertson.

The first Connecticut records for this species are as follows: — Branford, 3, 11, 22 August, 1904, and (collected from peach blossoms) 11 May, 1905 (H. W. W.).

H. (C.) **versatus** Robertson.

Occurs all over the commonwealth, and has been taken at Branford, Cheshire, Milldale, New Haven, Oxford, Pomfret, Sachem's Head, and Scotland, from May until November. It visits strawberry flowers.

H. (**Paralictus**) **cephalicus** Robertson.

Thus far only the female of this species has been recognized. The first Connecticut record for the species is New Haven, 10 May, 1904 (H. L. V.).

Sphecodes Latreille.

The bees of this genus are parasitic upon species of *Halictus*. In addition to the head and thorax, the abdomen is in some species black, though usually more or less red in the female.

Key to Species.

Females.

1. Mandibles rufous, base usually largely black 2
   Mandibles yellowish or reddish, with tip darker; flagel, tibiæ, and tarsi dark; enclosure distinct, coarsely reticulated; labrum entire ....**mandibularis**
2. Mandibles dentate; labrum not notched; fourth joint of antennæ equals or nearly equals second or third.......... 3
   Mandibles simple; labrum notched ....**confertus**
3. Vertex without a tubercle 4
   Vertex with a distinct tubercle; mesonotum closely and coarsely punctate; abdomen finely and sparsely punctate; fourth and fifth segments of abdomen black, remainder red ....**heraclei**
4. Abdomen, or at least first dorsal segment thereof, impunctate or nearly so; mesonotum not sulcate; abdomen entirely red ....**minor**
   Abdomen rather evenly, coarsely, and distinctly punctate, fifth segment of abdomen blackish, remaining part of abdomen red ....**arvensis**

Males.

1. Fourth antennal joint about equal in length to second and third combined 2
   Fourth antennal joint hardly longer than third; scutel sparsely punctate and shining; abdomen more or less reddish ....**mandibularis**
2. Third antennal joint twice as long as second; flagel notched beneath near apex; mandibles red; abdomen black, with seventh dorsal segment red, at least at apex.......**confertus**
   Third antennal joint not twice as long as second; fourth to thirteenth joints of flagel notched beneath and presenting distinct facets; abdomen entirely black; vertex without a tubercle; mesonotum with distinct punctures; abdomen not shining, closely punctate and closely pubescent ..**arvensis**

S. (**Drepanium**) **arvensis** Patton.

This species has been taken at Colebrook, New Haven, Rockville, Sachem's Head, Scotland, Stafford, and West Haven, in May, June, July, and August, either at random or visiting flowers of golden-rod, sunflower, parsnip, and common meadow-sweet.

S. (D.) confertus Say. *S. falcifer* Patton.

S. (Sphecodes) minor Robertson.

Only the female of this species is known, so right here is an opportunity for original research.

Stafford, 24 August, 1905 (W. E. B.), on golden-rod (*Solidago*).

°**S. (S.) heraclei** Robertson.

S. (Sphecodium) mandibularis Cresson. *S. cressoni* Robertson.

Occurs in all parts of the State, and has been taken at Branford, Colebrook, New Haven, and Stafford, in June, July, and August, visiting flowers of golden-rod (*Solidago*), New Jersey tea (*Ceanothus americanus*), and common day-lily (*Hemerocallis fulva*).

ANDRENIDÆ.

Andrena Fabricius.

These are short-tongued burrowing bees ranging in size from 6 mm. to 15 mm. In color they are black, with a few exceptions, which are reddish, brownish, or with a metallic tinge. In this genus, as in the genus *Halictus*, there are species of inestimable value to man on account of their habit of pollenizing the blossoms of our most important fruits such as the apple, cherry, plum, and others.

*Key to Species.**

Females.

1. Facial line as long as or shorter than transfacial line...... 2
Facial line distinctly longer than transfacial line; fovea extending below antennal line; pubescence pale; anal fimbria brown .... **bradleyi**
2. Abdomen with second dorsal segment impressed less than one-half distance from base to apex 3
Abdomen with second dorsal segment impressed one-half or more than one-half 15
3. First joint of flagel shorter than next two joints combined.. 4
First joint of flagel as long as or longer than next two joints combined 6

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4. Clypeal punctures not adjoining; facial fovea more than one-half as wide as distance between eye and lateral ocellus and extending below antennal line; wings dark brownish; pubescence whitish 5

Clypeal punctures adjoining or apparently so ....**daeckei**

5. Enclosure closely wrinkled ....**crataegi**

Enclosure with several widely separated striæ....**alleghaniensis**

6. Facial foveæ not separated from eye margin by a narrow space, only a shining line intervening in some species 7

Facial foveæ separated from eye margin by a narrow space; facial fovea more than one-half as wide as distance between eye and lateral ocellus; facial foveæ extending below antennal line; hairs of outer side of hind tibiæ simple; wings with three submarginal cells 20

7. Facial foveæ one-half or less than one-half as wide as distance between eye and lateral ocellus 11

Facial foveæ more than one-half as wide as distance between eye and lateral ocellus, extending below antennal line; most of the scopal hairs simple, hind tibiæ at apex not as broad as their metatarsi; fore wings with three closed submarginal cells; abdomen apparently impunctate and with abundant, erect, mostly pale pubescence; face with yellowish pubescence; scopa with dark hairs ....**hirticincta**

8. Facial foveæ extending below antennal line 9

Facial foveæ not extending below antennal line; most of the hairs on outer side of hind tibiæ simple, plumose or branched; length 10 mm.; clypeus uniformly dullish, sparsely punctate, but impunctate down middle; process of labrum nearly four times as wide as long; thorax and abdomen throughout more or less dullish, like head, except scutel, which is rather shining; pubescence pale, ochreous; scopa of hind tibiæ composed of simple upright hairs; abdomen subfasciate; color of anal fimbriæ golden brown; wings brownish, with a yellowish tinge ....**cornelli**

9. Cheeks rounded, without a margin behind 10

Cheeks rounded, but with a margin behind; most of the hairs on outer side of hind tibiæ simple 32

10. Most of the hairs on outer side of hind tibiæ simple; abdomen black 25

Most of the hairs on outer side of hind tibiæ plumose or branched; abdomen black; scopa of hind tibiæ loose, *i. e.*, with its hairs sparse ....**g. maculati**

11. Foveæ extending below antennal line 12

Foveæ not extending below antennal line; most of the hairs of outer surface of hind tibiæ plumose or branched 33

12. Most of the hairs of outer surface of hind tibiæ simple.... 13

Most of the hairs of outer surface of hind tibiæ branched; species resembling *arabis* and allies 47

13. Apex of hind tibiæ not twice as wide as metatarsus 14

Apex of hind tibiæ twice as wide as metatarsus; enclosure of propodeum conspicuously granular ....**nasoni**

14. Species with three closed submarginal cells............... 34

Species with two closed submarginal cells; process of labrum forming an obtuse-angled triangle; abdomen black ...... **andrenoides wellesleyana**

15. Abdomen with second dorsal segment impressed less than three-fourths distance from base to apex 16

Abdomen with second dorsal segment impressed three-fourths or more than three-fourths distance from base to apex; first joint of flagel shorter than second and third joints combined 17

16. Shining space between facial fovea and eye margin abruptly separated from fovea 51

Shining space between facial fovea and eye margin not abruptly separated from fovea; process of labrum broadly truncate; clypeus with no distinct median impunctate space; second dorsal abdominal segment impressed practically one-half distance from base to apex ....**rehni**

17. Shining foveal space as wide, or not as wide, as fovea below 55

Shining foveal space wider than fovea below; dorsulum with its punctures adjoining or nearly so 57

18. Abdomen not satiny 19

Abdomen satiny 21

19. Abdomen above without erect yellowish pubescence......... 20

Abdomen above with erect yellowish pubescence......**hirticincta**

20. Abdomen black; anal fimbriæ fuscous ....**novæangliæ**

Abdomen greenish ....**salictaria**

21. Abdomen without conspicuous satiny patches 22

Abdomen with conspicuous satiny patches; process of labrum rounded; abdomen with its tegument partly reddish, first dorsal segment being black at base and apex.. **brunniventris rhodura**

22. Length 11 mm.; process of labrum rather rounded; hind legs with their tegument dark or black; pubescence on dorsum of thorax ochreous to reddish; scopa of hind tibiæ light in color 23

Length 7-8 mm.; process of labrum finger-shaped in outline; pubescence pale, *i. e.*, whitish to ochreous; anal fimbriæ chocolate-brown or of an allied shade ....**placida**

23. Abdomen sericeous 24

Abdomen apparently bare, anal fimbriæ hrown ....**nivalis**

24. Anal fimbriæ brown ....**perplexa viburnella**

Anal fimbriæ golden ....**dunningi**

25. Process of labrum truncate, or semicircular, or, when seen from below, subemarginate 26

Process of labrum finger-shaped; anal fimbriæ from pale brown to blackish in color, usually the latter ....**placida**

26. Enclosure of metanotum granular.......................... 27

Enclosure smooth 30

27. Clypeus with a narrow but distinct median impunctate space 28

Clypeus with a rather circular impunctate area, which is usually highly polished and conspicuous; abdomen subfasciate ....**miserabilis flavoclypeata**

28. Clypeus closely punctate 29

Clypeus very sparsely punctate ....**robertsoni**

29. Pubescence ochreous to brownish ochreous; abdomen dull, not distinctly punctate; clypeus somewhat flattened; hind tibiæ blackish ....**arabis**

Pubescence as in *arabis;* hind tibiæ yellowish; abdomen distinctly punctate ....**winkleyi**

30. Wings without dark tips 31

Wings distinctly clouded at tip; clypeus abundantly and distinctly punctate ....**nubecula**

31. Dorsulum dull; clypeus dull and smooth ....**distans**

Dorsulum shining; abdomen dull ....**canadensis**

32. Process of labrum quadrate or nearly so, and margined..**fragilis**

Process of labrum rounded, not margined ....**integra**

33. Face immaculate 59

Face maculated, process of labrum not emarginate, or hardly so; clypeus sparsely punctate ....**accepta**

34. Abdomen not distinctly punctate 35

Abdomen distinctly punctate, i. e., almost umbilicately punctate 41

35. Abdomen appearing bare, without abundant erect hairs; abdomen and scopa with pale pubescence; wings pale brownish 36

Abdomen not appearing bare, with abundant erect hairs.... 38

36. Abdomen fasciate; clypeus distinctly punctate and shining.. 37

Abdomen subfasciate; clypeus indistinctly punctate, dullish **ziziæ**

37. Anal fimbriæ ochreous ....**bisalicis**

Anal fimbriæ dark brown ....**novæangliæ**

38. Abdomen and scopa with pale pubescence 39

Abdomen above and scopa with dark pubescence, abdominal pubescence mostly black; clypeus with a median impunctate space ....**milwaukeensis**

39. Abdomen without distinct bands of nearly erect pubescence; face without black pubescence; abdomen fasciate, shining; clypeus with a median impunctate space ....**thaspii**

Abdomen with distinct bands of nearly erect pubescence.... 40

40. Clypeus dull; nearly all of the scopal hairs white; anal fimbriæ gray and fuscous ....cockerelli
Clypeus shining; scopa golden ....thaspii

41. Abdomen and scopa with pale hairs 42
Abdomen and scopa with dark or black hairs; species with some pale pubescence 46

42. Clypeus without a distinct, shining median impunctate space 43
Clypeus with a distinct, shining, median impunctate space; enclosure not entirely rugulose ....hilaris

43. Enclosure not rugulose, at most granular; clypeus shining 44
Enclosure rugulose ....hilaris

44. Clypeus not produced 45
Clypeus produced ....davisi

45. Hind tibiæ honey-yellow; abdomen subfasciate ....commoda
Hind tibiæ blackish; enclosure wrinkled, process of labrum semicircular in outline ....cressoni

46. Face and pleuræ with pale pubescence; clypeus with an indistinct median impunctate space ....vicina
Face and pleuræ with some black pubescence; clypeus with a median impunctate space; species over 12 mm., in length; dorsum of thorax without black pubescence............carlini

47. Process of labrum not emarginate, but truncate anteriorly, the truncation wider than the process is long; clypeus shining, not densely punctate; clypeus not maculated .. 48
Process of labrum emarginate; clypeus not dull, not densely punctate, but with a median impunctate space 50

48. Clypeus without a median impunctate space; length 13 mm. 49
Clypeus with a median impunctate space; most of middle third of clypeus occupied by an impunctate space; species resembling *miserabilis flavoclypeata* ....pennsylvanicola

49. Clypeus polished ....helianthi
Clypeus not polished ....braccata

50. Scopa loose ....angusi
Scopa compact; wings blackish ....asteris

51. Second dorsal abdominal segment impressed one-half distance from base to apex 52
Second dorsal abdominal segment impressed more than one-half 54

52. Abdomen black 53
Abdomen red, not fasciate ....mariæ

53. Abdomen fasciate ....forbesi
Abdomen not fasciate ....mariæ var. concolor

54. Hind tibiæ and tarsi black or blackish 55
Hind tibiæ and tarsi stramineous ....hippotes

55. Abdomen not fasciate ....weedi
Abdomen fasciate, second dorsal segment impressed less than two-thirds distance from base to apex ....obscura

56. Second abdominal segment impressed two-thirds distance from base to apex; abdomen densely punctate; its segments without stramineous margin .... multiplicata

Second abdominal segment impressed more than two-thirds, abdomen fasciate; depressed portion of second dorsal abdominal segment indistinctly punctate; clypeus without a margin .... multiplicatiformis

57. Shining space of the face oblong 58

Shining space of the face cuneate; second dorsal abdominal segment impressed two-thirds distance from base to apex spireana

58. Abdomen not fasciate .... rugosa

Abdomen fasciate .... pænerugosa

59. Process of labrum emarginate .... solidaginis

Process of labrum not emarginate; abdomen dull, strongly sparsely punctured .... erigeniæ

Males.

1. Facial line as long as or shorter than transfacial line; abdomen with second segment impressed less than one-half, or at most impressed one-half distance from base to apex 2

Facial line longer than transfacial line; clypeus partly yellow bradleyi

2. Third antennal joint shorter than or as long as fourth...... 3

Third antennal joint longer than fourth 10

3. Penultimate ventral abdominal segment without reflexed angles 4

Penultimate ventral abdominal segment with reflexed angles cratægi

4. Second dorsal abdominal segment impressed one-half or at least more than one-third distance from base to apex 5

Second dorsal abdominal segment impressed one-third distance from base to apex .... daeckei

5. Antennæ smooth and shining; enclosure rugose 6

Antennæ dull 7

6. Abdomen fasciate above .... forbesi

Abdomen not fasciate above .... mariæ var. concolor

7. Abdomen black 8

Abdomen more or less reddish .... mariæ

8. Tarsi blackish or brownish 9

Tarsi yellowish .... hippotes

9. Enclosure rugose .... weedi

Enclosure granular .... nasoni

10. Face immaculate 11

Face with yellow or whitish maculæ 28

11. Third antennal joint longer than fourth but shorter than fourth and fifth joints combined 12

Third antennal joint as long as, or longer than fourth and fifth joints combined 27
12. Cheeks prominently angulate or keeled 13
Cheeks neither angulate nor keeled 20
13. Cheeks prominently angulate, not keeled 14
Cheeks keeled ....**fragilis**
14. Mandibles toothed on under side near base; tooth on under side of mandibles a mere angle 15
Mandibles not toothed on under side near base 16
15. Pubescence of abdomen pale ....**thaspii**
Pubescence of abdomen partly dark ....**milwaukeensis**
16. Face without black pubescence 17
Face with some black pubescence ....**cockerelli**
17. Wings not clouded with brownish 18
Wings, in part, distinctly clouded with brownish.......**nubecula**
18. Dorsulum dull 19
Dorsulum polished ....**canadensis**
19. Abdomen dull, with ochreous, erect pubescence......**hirticincta**
Abdomen shining, with appressed pubescence .... **brunniventris rhodura**
20. Face with black hairs 21
Face without black hairs 22
21. Abdomen not fasciate ....**carlini**
Abdomen fasciate ....**bisalicis**
22. Tarsi yellowish 23
Tarsi brownish or blackish 24
23. Abdomen black; length 12 mm. or more ....**nivalis**
Abdomen greenish; length 8 mm. or less ....**salictaria**
24. Third antennal joint longer than fourth joint 25
Third antennal joint as long as fourth joint ....**vicina**
25. Abdomen not sericeous 26
Abdomen sericeous ....**commoda**
26. Length 8 mm. ....**placida**
Length more than 8 mm. ....**victima**
27. Angles of sixth ventral abdominal segment reflexed....**erigeniæ**
Angles of sixth ventral abdominal segment not reflexed 36
28. Wings with three closed submarginal cells 29
Wings with two closed submarginal cells .... **andrenoides wellesleyana**
29. Cheeks not angulate 30
Cheeks rounded angulate ....**miserabilis flavoclypeata**
30. Maculation confined to clypeus 31
Maculation not confined to clypeus 34
31. Third antennal joint as long as fourth and fifth joints combined, or a little longer 32
Third antennal joint longer than fourth joint, but not as long as fourth and fifth joints combined ....**robertsoni**

32. Pubescence whitish; hind femora black 33
Pubescence tawny or ochreous; posterior femora partly yellowish .... **helianthi**
33. Abdomen dull, fasciate .... **braccata**
Abdomen shining, subfasciate .... **ziziæ**
34. Tarsi brownish or blackish 35
Tarsi yellowish .... **accepta**
35. Abdomen distinctly punctate .... **cressoni**
Abdomen not distinctly punctate .... **asteris**
36. Angle of cheeks opposite middle of eye .... **distans**
Angle of cheek below middle of eye .... **g. maculati**

°**A. alleghaniensis** Viereck.

A. cratægi Robertson.

Taken at New Haven, Branford, Yalesville, and Poquonock, and is sure to be found throughout the State. Visits flowers of sweet cherry, Japan plum, and other fruits.

°**A. daeckei** Viereck.

May be found in Connecticut, along the Sound.

A. nivalis Smith. *A. convexa* Provancher.

Throughout the State. On flowers of *Lonicera fragrantissima*, New Haven, 4 May, 1904 (H. L. V.).

A. placida Smith. *A. salicacea* Robertson. *A. macilenta.* Provancher. *A. macgillivrayi* Cockerell.

This is no doubt generally distributed throughout the State. New Haven, 4, 10, 25 May, 1904 (H. L. V.). Visits flowers of gooseberry and Japan plum.

***A. brunniventris rhodura** Cockerell.

Type locality: Hartford.

A. dunningi Cockerell.

Occurs throughout the State.

A. perplexa viburnella Graenicher.

Occurs throughout the State.

°**A. cornelli** Viereck.

A. miserabilis flavoclypeata Smith. *A. bipunctata* Authors.

New Haven, 4-22 May (H. L. V., B. H. W.); and probably throughout the State. It is one of the important pollenizers of apple, pear, and other fruit blossoms.

A. robertsoni Dalla Torre. *A. serotina* Robertson.

Occurs with the preceding species, but not so commonly. Putnam, 12 July, 1905 (H. L. V.).

A. arabis Robertson.

This appears in early spring.

A. nubecula Smith.

Stafford, 24 August, 1905 (W. E. B.).

°**A. distans** Provancher.

A. canadensis Dalla Torre.

Stafford, 24 August, 1905 (W. E. B.).

A. g. maculati Robertson.

Milldale, 21 May, 1906 (B. H. W.).

°**A. erigeniæ** Robertson.

A. fragilis Smith. *A. platyparia* Robertson. *A. laticeps* Provancher. *A. provancheri* Dalla Torre.

Branford, 27 June, 1904 (H. L. V.)

A. integra Smith. *A. lineata* Provancher.

Brookfield, 26 May, 1904, on *Zizia aurea* (W. E. B.).

A. solidaginis Robertson. Pl. x, Fig. 10.

New Haven, 16 August, 1904 (B. H. W.); Stafford, 24 August, 1905 (W. E. B.), on goldenrod.

°**A. accepta** Viereck. *A. pulchella* Robertson.

A. nasoni Robertson. *A. vestita* Provancher. *A. hartfordensis* Cockerell.

New Haven, 4-14 May, 1904 (H. L. V.), 13 June, 1902 (E. J. S. M.), 8-22 May, 1905 (B. H. W.); Branford, 3 May, 1905 (H. W. W.).

This is one of the pollenizers of fruit blossoms, and visits currant, gooseberry, pear, and apple.

A. novæangliæ Viereck.

New Haven, 4 May, 1904 (H. L. V.).

A. ziziæ Robertson.

Brookfield, 26 May, 1904, on flowers of *Zizia aurea* (B. H. W.).

°**A. cockerelli** Graenicher.

A. hirticincta Provancher. *A. americana* Dalla Torre. *A. fimbriata* Smith.

Westbrook, 30 August, Branford, 16 September, 1904 (H. L. V.); New Haven, 12 September, 1904 (B. H. W.).

Visits flowers of the goldenrod and other flowers of the late summer and early fall.

°**A. milwaukeensis** Graenicher.

***A. winkleyi** Viereck.

Type locality: Branford, 22-26 May, 1905 (H. W. W.); also New Haven, 14 May, 1904 (H. L. V.). Visits flowers of quince, raspberry, gooseberry, and possibly other fruits.

°**A. davisi** Viereck.

°**A. commoda** Smith. *A. corni* Robertson.

A. cressoni Robertson.

Visits flowers of *Pyrus arbutifolia*.

New Haven, 28 April, 1902, 24 May, 1905 (W. E. B.), 26 May, 1904 (H. L. V.); Mt. Carmel, 23 June, 1902 (E. J. S. M.).

A. hilaris Smith.

New Haven, 17 June, 1905 (H. L. V.), on flowers of raspberry.

A. vicina Smith. Howard, Insect Book, Pl. iii, Fig. 3.

Many specimens from New Haven and Branford in May.

Visits flowers of some of the fruit trees, and of the gooseberry.

A. carlini Cockerell.

Occurs with the preceding at New Haven and Branford.

°**A. andrenoides wellesleyana** Robertson.

Visits the willow.

°**A. pennsylvanicola** Viereck.

°**A. helianthi** Robertson.

Visits the sunflower.

***A. braccata** Viereck.

Type locality: Rockville, 23 August, 1905 (H. L. V.). Also Westbrook, 30 August, 1904 (H. L. V.); Stafford, 24 August, 1905 (W. E. B.); Branford, 16 September, 1904 (H. W. W.); on goldenrod flowers.

°**A. angusi** Viereck.

A. asteris Robertson.

Received its name from its habit of visiting flowers of aster. Westbrook, 30 August, 1904 (H. L. V.)

°**A. rehni** Viereck.

A. forbesi Robertson.

New Haven, on flowers of pear and currant (H. L. V.).

A. mariæ var. **concolor** Robertson.

New Haven, 7 May, 1904 (H. L. V.), 3 June, 1904, (W. E. B.); on flowers of blackberry, currant, and gooseberry.

°**A. mariæ** Robertson.

A. thaspii Graenicher.

Visits fruit blossoms and azalea flowers.

A. weedi Viereck.

New Haven, 4 May, 1904 H. L. V.). Visits flowers of the gooseberry.

A. obscura Robertson.

Colebrook, 21 July, 1905 (H. L. V.).

A. hippotes Robertson.

New Haven, 4-14 May, 1904 H. L. V.); Branford, 3 May, 1905 (H. W. W.); on flowers of the apple, Japan plum, and sweet cherry.

°**A. multiplicata** Cockerell.

A. spireana Robertson.

Mt. Carmel, 23 June, 1902 (E. J. S. M.).

A. multiplicatiformis Viereck.

Thompson, 11 July, 1905 (H. L. V.).

A. rugosa Robertson.

°**A. pænerugosa** Viereck.

A. bradleyi Viereck.

Visits flowers of the gooseberry and huckleberry.

A. bisalicis Viereck. *A. salicis* Robertson.
Hartford, 25 April, 1897 (S. N. D.).

A. salictaria Robertson.
Hartford, 10 May, 1896 (S. N. D.).

A. victima Smith.
Hartford, 29 April, 1894 (S. N. D.).

DUFOUREIDÆ.

Only one species of this group is recorded from the State.

Halictoides (Conohalictoides) novæangliæ Robertson.

Almost entirely black. Length 6-7 mm. Some black [illegible] on the head, but the pubescence is mostly whitish; face [illegible] longer than the transfacial line. Has been taken in Jul [illegible] August. This species visits the pickerel-weed (*Pont* [illegible] *cordata*) and is doubtless present wherever the pickere [illegible] grows.

Sachem's Head, 4 August, 1904, Thompson, 12 July, [illegible] (H. L. V.).

MACROPIDÆ.

The species of this family are succinct and almost [illegible] black. Only one genus is on record, and the characters [illegible] family will suffice for its recognition.

Macropis Panzer.

Key to Species.

Females.

1. Hind metatarsi mostly with pale whitish pubescence 2
   Hind metatarsi mostly with dark, blackish pubescence .. morse
2. Punctation, especially of scutel, sparse.................... cilia
   Punctation, especially of scutel, dense .... patella

Males.

1. Hind metatarsi oblong or nearly so 2
   Hind metatarsi cuneiform .... patella
2. Hind tibiæ with a yellow spot at base .... cilia
   Hind tibiæ entirely black ..,.................................... morse

M. patellata Patton.

Occurs all over the State, and flies at least from 6 to 21 [illegible] visiting flowers of *Cicuta maculata*, *Rhus glabra*, and *Steiron* [illegible] *ciliatum*. Has been taken at New Haven, Branford, Putnam, and Colebrook.

M. ciliata Patton.

Probably occurs all over the State. In Maine the females have been observed visiting the flowers of *Lysimachia terrestris, Aralia hispida,* and *Kalmia angustifolia*. The males are found on the last two plants and also on goldenrod.

New Haven, 13 June, Mt. Carmel, 23 June, 1902 (E. J. S. M.).

°**M. morsei** Robertson.

PANURGIDÆ.

Key to Genera.

1. Marginal cell always much longer than stigma 2
   Marginal cell not longer than stigma, usually shorter.... **Perdita** p. 721
2. Abdomen not fasciate; mesopleuræ bare or nearly so ...... **Panurginus** p. 721
   Abdomen fasciate, mesopleuræ pubescent ......**Calliopsis** p. 722

Perdita Smith.

Key to Species.

Facial line longer than transfacial line; abdomen with four yellow marks ....**novæangliæ**

Facial line not longer than transfacial line; abdomen with more than four yellow marks, usually eight .....**octomaculata**

***P. novæangliæ** Viereck.

Type locality: Poquonock, 27 June, 1905 (H. L. V.).

P. octomaculata Say.

Stafford, 24 August, 1905 (W. E. B.), on flowers of goldenrod. Also visits asters.

Panurginus Nylander.

Key to Species.

Females.

Thorax appearing almost bare; dorsulum dullish..........**parvus**

Thorax pubescent; dorsulum polished ....**asteris**

Males.

(In addition to the female characters) clypeus, two lateral face marks, and a supraclypeal mark yellow ....**asteris**

(In addition to the female characters) clypeus and two lateral face marks luteous .... **parvus**

P. parvus Robertson.

New Haven, 4 July, 1905 (H. L. V.), on flowers of New Jersey tea; Mt. Carmel, 23 June, 1902 (E. J. S. M.).

P. asteris Robertson.

Stafford, 24 August, 1905 (W. E. B.), on goldenrod.

Calliopsis Smith.

A single species is known to inhabit this State. It may be recognized by the fasciate abdomen, maculation luteous in the female and yellow in the male; the face and legs in the male being almost entirely yellow.

C. andreniformis Smith.

New Haven, 24 June, 1902, 6 July, 1904, 4 July, 1905 (E. J. S. M., P. L. B., H. L. V.). On the last date it was taken on flowers of New Jersey tea; also 19 July, 1905 (B. H. W.), and 20 July, 1904 (W. E. B.); Branford, 3 August, 1904 (H. W. W.). In Maine it has been taken on flowers of *Solidago juncea.*

NOMADIDÆ.

This group, known as cuckoo bees, comprises species mostly under 10 mm. in length, reddish or black, or both, usually maculated with yellow or luteous, and living parasitically in the nests of other bees.

Key to Genera.

1.	Marginal cell separated from costa	2
	Marginal cell at apex not separated from costa; maxillary palpi six-jointed	**Nomada** p. 722
2.	Maxillary palpi with less than six joints	3
	Maxillary palpi with six joints	**Neopasites** p. 730
3.	Maxillary palpi with less than five joints	4
	Maxillary palpi with five joints	**Viereckella** p. 727
4.	Maxillary palpi with two joints	**Epeolus** p. 728
	Maxillary palpi with three joints	**Triepeolus** p. 728

Nomada Fabricius.

Key to Species.

1.	Mandibles with a tooth near apex	2
	Mandibles without a tooth near apex	8

2. Females 3
Males; intermediate joints of antennæ longer than thick.... 7
3. Pygidium ovate, sparsely punctate and pubescent; lower anterior orbits not yellowish; mesonotum not lined; head and thorax almost entirely red; second to fifth dorsal abdominal segments with a yellow mark on each side ... **maculata**
Pygidium triangular, sparsely punctate and pubescent; lower anterior orbits not yellowish; mesonotum one-lined; rather dark red; spots distinct, large on second segment 4
4. First dorsal abdominal segment without a yellow mark, second and third segments with a yellow mark on each side 5
First dorsal abdominal segment as well as second to fifth segments with a yellow mark on each side **cuneata var. notata**
5. Fifth dorsal abdominal segment with a yellow mark on each side 6
Fifth dorsal abdominal segment as well as fourth without a yellow mark on each side ....**cuneata var. quadrisignata**
6. Fourth dorsal abdominal segment with a yellow mark on each side ....**cuneata var. octonotata**
Fourth dorsal abdominal segment without a yellow mark on each side ....**cuneata var. sexnotata**
7. Tegulæ and legs red; scutel usually red; abdomen varying from six- to eight-spotted ....**cuneata**
Tegulæ and legs mostly brownish; scutel black, thorax black; head mostly black; first dorsal abdominal segment with two luteous spots, second to sixth segments with a luteous band ....**bella**
8. Fore coxæ with long, pubescent spines; abdomen distinctly punctate; third antennal joint shorter than fourth; basal vein inserted a little before nervulus; marginal cell acute **americana**
Fore coxæ simple, rarely with short, indistinct spines...... 10
9. Females 10
Males 25
10. Third antennal joint not distinctly shorter than fourth.... 11
Third antennal joint distinctly shorter than fourth 17
11. Third antennal joint only a little shorter or just as long as fourth 12
Third antennal joint longer than fourth, rarely a little shorter; head and thorax with yellow ornaments, usually black 13
12. Basal vein inserted before nervulus; apex of hind tibiæ with black, curved bristles; second dorsal abdominal segment with a yellow spot on each side, rest of abdomen mostly

reddish; thorax mostly black, striped and marked with reddish .... perplexa

Basal vein interstitial with nervulus; apex of hind tibiæ with black, curved bristles; abdomen immaculate, reddish; head and thorax mostly reddish; dorsulum with a black stripe .... incerta

13. Propodeum with two yellow patches 14

Propodeum entirely black 16

14. Abdomen with five yellow fasciæ 15

Abdomen with four yellow fasciæ; mesonotum coarsely punctate, pubescent; basal vein before nervulus; flagel reddish .... imbricata

15. Mesonotum finely punctate, pubescent; basal vein inserted before nervulus; flagel dark above .... affabilis

Mesonotum strongly punctate, nearly bare; basal vein virtually interstitial with nervulus; flagel with a dark annulus .... vincta

16. First to third dorsal abdominal segments with an interrupted yellow band, fourth and fifth with a continuous yellow band; scutel with a yellow spot on each side; postscutel with a yellow band; head, thorax, and abdomen mostly black; legs mostly red .... electa

First dorsal abdominal segment black or with a reddish stain, second and third segments with interrupted, fourth and fifth with continuous bands; basal vein not inserted before nervulus; scutel hardly bilobed; third antennal joint sometimes a little shorter than fourth .... placida

17. Head and thorax without yellow ornaments, basal vein before nervulus 18

Head and thorax with yellow ornaments 23

18. Head and thorax red, sutures black; scutel crested, bilobed.. 19

Head and thorax black, with reddish ornaments; abdomen black, with yellow ornaments; an interrupted line on first dorsal segment, lateral marks on second and third dorsal segments, continuous fasciæ on fourth and fifth segments .... vicina

19. Fourth antennal joint as long as twelfth or longer 20

Fourth antennal joint shorter than twelfth; a spot on each side of second and third segments, and usually a band or two spots on fifth; pygidium broadly rounded, closely pubescent .... illinoiensis

20. Fourth antennal joint as long as twelfth 21

Fourth antennal joint longer than twelfth; no spot on first and second dorsal abdominal segments, and the interrupted band on third, fourth and fifth segments almost entirely luteous .... rubicunda

21. Fore coxæ without spines; a spot on each side of second and third dorsal abdominal segments 22

Fore coxæ with a short spine; pygidium subacute; yellow fascia on fifth dorsal abdominal segment opaque..**denticulata**

22. Length less than 8 mm. ....**sayi**

Length 10 mm. ....**bisignata**

23. First transverse cubitus usually present 24

First transverse cubitus usually wanting; largely red; second to fifth dorsal abdominal segments with yellow fasciæ, sometimes interrupted on second ....**obliterata**

24. Mesonotum black; second to fifth dorsal abdominal segments with more or less interrupted yellow bands; scutel mostly, propodeum partly, yellow ....**festiva**

Mesonotum with four yellow lines; first to sixth dorsal abdominal segments with yellow bands; propodeum with subquadrate marks encroaching upon the enclosure ....**luteola**

25. Seventh dorsal abdominal segment entire 26

Seventh dorsal abdominal segment notched; third antennal joint shorter than fourth 29

26. Third antennal joint longer than fourth 27

Third antennal joint shorter than fourth; basal vein inserted a little before nervulus; abdomen black, with yellow marks; mostly black ....**proxima**

27. Propodeum with two yellow spots; posterior orbits largely yellow 28

Propodeum and posterior orbits black or nearly so; fifth and sixth dorsal abdominal segments with continuous, second to fourth with interrupted yellow bands; first dorsal abdominal segment entirely black; basal vein usually interstitial with nervulus ....**placida**

28. Scape obovate; basal vein interstitial with nervulus; flagel darker in the middle; scutel sub-bilobed ....**vincta**

Scape ordinary; basal vein inserted before nervulus; flagel darker above; scutel bilobed ....**affabilis**

29. First transverse cubitus usually present 30

First transverse cubitus usually wanting ....**obliterata**

30. First to sixth dorsal abdominal segments without entire and continuous bands, usually with some lateral spots; when continuous the bands have separated spots on extreme sides of fifth segment 31

First to sixth dorsal abdominal segments with entire and continuous bands, sometimes narrowly interrupted on first; basal vein inserted before nervulus; a band on first dorsal abdominal segment continuous; flagel usually dark, piceous beneath, joints cylindrical ....**luteola**

31. Abdomen mainly black 35

Abdomen chiefly reddish; basal vein inserted before nervulus 32

32. Flagel and fore coxæ not denticulate 33
Flagel and fore coxæ denticulate; a yellowish spot on each side of second segment, as well as sometimes on first, and usually a continuous yellowish band on third to sixth segments ....denticulata

33. Fourth antennal joint as long as thirteenth 34
Fourth antennal joint shorter than thirteenth; apical half of abdomen reddish; middle of flagel longer than thick.... illinoiensis

34. Thorax almost entirely black; dorsulum entirely black ....sayi
Thorax partly black; dorsulum mostly reddish with a black stripe down the middle ....pygmæa

35. First dorsal abdominal segment without a spot on each side 36
First to third dorsal abdominal segments with a yellowish spot on each side; apex of seventh dorsal segment deeply notched ....articulata

36. Second and third dorsal abdominal segments with a yellowish spot on each side; first usually with an interrupted band, fourth with a band or two spots on each side, fifth with a discal band and a spot on each side, sixth like fifth, or lateral spots wanting, seventh with apex slightly notched vicina
Second to fifth dorsal abdominal segments with a more or less interrupted yellowish band, sixth with a band; head and thorax almost entirely black ....gracilis

N. (Gnathias) maculata Cresson. Howard, Insect Book, Pl. iv, Fig. 15.

N. (G.) cuneata Robertson.

New Haven, 4 May, 1904, Double Beach, 5 July, 1904 (H. L. V.).

°N. (G.) cuneata var. notata Robertson.

°N. (G.) cuneata var. octonotata Robertson.

°N. (G.) cuneata var. sexnotata Robertson.

°N. (G.) cuneata var. quadrisignata Robertson.

N. (G.) bella Cresson.

N. (Centrias) americana Kirby.

West Haven, 27 June, 1905 (H. L. V.)

*N. (C.) incerta Cresson.

°N. (Phor) proxima Cresson.

N. (Holonomada) imbricata Smith.

New Haven, 4 May, 1904 (H. L. V.).

°**N. (H.) affabilis** Robertson.

°**N. (H.) vincta** Robertson.

°**N. (H.) placida** Robertson.

N. perplexa Cresson.

***N. vicina** Cresson.

Salisbury, 27 August, 1904 (W. E. B.); Saybrook, 31 August, 1904 (H.L.V.).

N. (Nomada) electa Cresson.

N. (N.) illinoiensis Robertson.

Branford, 11 May, 1905 (H. W. W.).

°**N. (N.) rubicunda** Olivier. *N. torrida* Smith.

N. (N.) denticulata Robertson.

New Haven, 26 May, 1904 (H. L. V.).

N. (N.) sayi Robertson.

Branford, 3 May, 1905 (H. W. W.); West Haven, 27 June, 1905 (H. L. V.).

N. (N.) bisignata Say.

N. (N.) articulata Smith.

°**N. (N.) gracilis** Cresson.

***N. (N.) pygmæa** Cresson.

N. (Heminomada) obliterata Cresson.

Hartford, 20 May, 1904 (H. L. V.).

N. (Xanthidium) luteola LePeletier.

°**N. (X.) festiva** Cresson.

Viereckella Swenk.

Only two species are known to belong to this genus. They both look as if they might be black Nomadas. Indeed, the species that occurs in this State was originally described as *Nomada*.

V. pilosula (Cresson).

Mandibles simple, without a tooth near apex; fore coxæ simple, without spines, uniformly black or brownish; female with the basal vein inserted beyond or interstitial with nervulus; third antennnal joint in female distinctly shorter than fourth; male with third antennal joint longer than fourth, and with the seventh dorsal abdominal segment entire, without a notch at its apex.

Brookfield, 27 July (E. L. Dickerson).

Epeolus Latreille.

This genus, as now restricted, is represented in Connecticut by a single species.

E. pusillus Cresson.

Length 6-8 mm. Front not tuberculate; lower half of pleuræ finely and closely punctate; lateral spines of the scutel hardly extending beyond the latter; spurs black. Pubescence pale cinereous or silvery; tubercles, tegulæ, and legs reddish.

Stafford, 24 August, 1905 (W. E. B.), on goldenrod; Saybrook, 31 August, 1904 (H. L. V.), on flowers of fireweed (*Erechtites hieracifolia*).

Triepeolus Robertson.

Key to Species.

Females.

1. Fifth ventral abdominal segment convex; corresponding dorsal segment usually with lateral patches 2
   Fifth ventral abdominal segment flattened or concave; corresponding dorsal segment with a semicircular sericeous truncation; black; mesonotum anteriorly with a broad pale yellow band; border of first dorsal abdominal segment broad, interrupted basally and sometimes apically; fasciæ continuous on second to fourth segments, gradually or abruptly widened laterally on second segment; length 13-16 mm. ....**concavus**
2. Border of first dorsal abdominal segment much wider on sides than near middle 3
   Border of first dorsal abdominal segment of almost uniform width 4
3. Mesonotum bilineate; fifth dorsal abdominal segment dull, densely punctate; its apex convex, the beveled space thereof always, and lateral patches of pubescence usually distinct; apex of pygidium convex; fasciæ on first and second segments interrupted, on third and fourth segments

continuous, that on fourth of the same color as the other fasciæ; second to fourth ventral abdominal segments with apical fasciæ; labrum, mandibles, first three joints of antennæ, and legs red; length 11-12 mm. ....**lunatus**

Mesonotum with a subcordate enclosed space; fasciæ interrupted on first and second dorsal abdominal segments, gradually widened on sides of second segment; space on mesonotum trilobed; an L-shaped patch of pubescence on pleuræ; scutel sub-bilobed; spines distinct; length 10-14 mm. ....**remigatus**

4. Ornaments cream-color; pectus finely and closely punctate; false pygidium large; pleuræ with a lunate patch; femora usually more or less black; labrum, mandibles, scape, tubercles, and tegulæ usually red; legs rarely black; length 8-12 mm. ....**cressoni**

Ornaments cinereous; length 11-12 mm. ....**donatus**

Males.

1. Border of first dorsal abdominal segment broader laterally, forming lunate or subquadrate patches; ornaments cream-color 2

Border of first dorsal abdominal segment hardly broader laterally than near middle; mesonotum bilineate 5

2. Disc of mesonotum not enclosed by a complete border; ornaments cream-color; tibiæ and tarsi usually red; mid and hind femora more or less black; mandibles, labrum, base of antennæ, and tegulæ red; rarely entirely black; length 8-11 mm. ....**cressoni**

Disc of mesonotum enclosed by a complete border; abdomen with six bands, interrupted on first and second segments, gradually widening on sides of second, cinereous on sixth; length 10-15 mm. ....**remigatus**

3. Mesonotum anteriorly with a broad band; abdomen with five bands, first dorsal segment with its band continuous or interrupted, second to fifth with continuous fasciæ; black; length 12-15 mm. ....**concavus**

Mesonotum bilineate; abdomen with six bands, bands on first two dorsal segments and sometimes on third interrupted, and cinereous or whitish on fifth and sixth segments; labrum, mandibles, first three antennal joints, tegulæ, and legs red; length 10-13 mm. ....**lunatus**

T. lunatus Say. Howard, Insect Book, Pl. iv, Fig. 18. Saybrook, 31 August, 1904 (H.L.V.), on flowers of fireweed (*Erechtites hieracifolia*); East Hartford, 2 August, 1905 (B. H. W.).

T. donatus Smith. Howard, Insect Book, Pl. iv, Fig.
Prospect, 15 August, 1906; Stafford, 24 August,
(W. E. B.).

°**T. concavus** Cresson. Howard, Insect Book,
Fig. 8.

°**T. remigatus** Fabricius. Howard, Insect Book,
Fig. 28.

°**T. cressoni** Robertson. *T. mercatus* Fabricius.

Neopasites Ashmead.

Formerly *Philerémus*. A single species has been
this State.

N. illinoiensis Robertson.

Length 5 mm. Abdomen usually reddish, rarely
black, but always with a golden apical margin to its dorsal segments. Head and thorax black, with short, silvery pubescence;
legs inclining to a dull reddish.

New Haven, 30 June, 1905 (B. H. W.).

EUCERIDÆ.

Solitary digger-bees with but one female and one male
nest.

Key to Genera.

1. Anterior inferior orbits with a large subtriangular malar space; clypeus remote from eye ....
   Anterior inferior orbits with a small subtriangular space; clypeus nearly touching eye; maxillary palpi with three, four, or five joints ....Melissodes p.
2. Maxillary palpi with five joints ....
   Maxillary palpi with six joints ....Tetralonia p.
3. Claws toothed but not cleft ....Cemolobus p.
   Claws cleft ....Xenoglossa p.

Melissodes Latreille.

Key to Species.

Females.

1. Maxillary palpi 3 or 4-jointed ....
   Maxillary palpi 5-jointed; pubescence of thorax mixed with black; abdomen somewhat metallic; second to fourth dorsal abdominal segments with fasciæ of white appressed

pubescence, the fasciæ broad laterally, narrow and basal medially, fifth with a white patch on each extreme side ... **condigna**

2. Hairs of scopa branched 3

Hairs of scopa not branched; pubescence of thorax fulvo-ochraceous; second to fourth dorsal abdominal segments with narrow, median, white pubescent fasciæ ....**compta**

3. Scutel and disc of mesonotum without evident black or fuscous hair 4

Scutel and disc of mesonotum with evident black or fuscous hair 6

4. Fasciæ on base and middle of second, on middle of third, and on apical margin of fourth dorsal abdominal segments 5

Fasciæ obsolete or nearly so; scopa ochraceous; pubescence on back of body short, dense, pale; that of occiput black **desponsa**

5. Fasciæ on fourth dorsal abdominal segment not enclosing a diamond-shaped black patch; pubescence fulvous; fasciæ broad, nearly covering second to fourth dorsal abdominal segments, fascia on fourth segment entire; maxillary palpi usually 4-jointed ....**agilis** var. **aurigeniæ**

Fasciæ narrow, on fourth dorsal abdominal segment, neither notched nor interrupted, but bordered by deep brown pubescence posteriorly; tegulæ brown; maxillary palpi 3-jointed; labial palpi with first joint nearly as long as second ....**dentiventris**

6. Wings clear or nearly so, sometimes purplish; black patch on mesonotum reaching tegulæ, or nearly; pubescence of vertex mostly black; fore and mid legs with blackish pubescence 7

Wings more or less clouded or fuscous 8

7. Pubescence on clypeus, labrum, vertex, part of mesonotum, and scutel blackish ....**rustica**

Pubescence ochraceous even on clypeus ....**perplexa**

8. Fourth dorsal abdominal segment with an apical patch of white pubescence on each side ....**bimaculata**

Fourth dorsal abdominal segment not ornamented as in *bimaculata;* with broad, oblique, apical fasciæ on second and third segments, nearly obsolete on second; vertex with black hairs; most of the pleural hairs black ....**obliqua**

Males.

1. Antennæ pale beneath, third joint shorter than fourth 2

Antennæ black, third joint as long as fourth ....**compta**

2. Abdomen without metallic reflections 3

Abdomen with metallic reflections ....**condigna**

3. Seventh abdominal segment with lateral spines 4

Seventh abdominal segment without lateral spines; pubescence of hind legs not black; fasciæ on second and third dorsal abdominal segments narrow, arcuate; tarsi black **obliqua**

4. Shortest side of third antennal joint not longer than second 5
Shortest side of third antennal joint longer than second 7
5. Apical margins of abdominal segments pale stramineous.. 6
Apical margins of abdominal segments black or dull; pubescence fulvous, mixed with black on mesonotum and scutel ....**perplexa**
6. Pubescence pale ochraceous to fulvous; labrum yellow.. **agilis** var. **aurigeniæ**
Pubescence pale ochraceous to fulvous; labrum yellow except at extreme sides ....**dentiventris**
7. Base of mandibles and labrum usually maculated; pubescence usually black; wings clouded ....**bimaculata**
Base of mandibles and labrum usually black; pubescence of legs black and short ....**desponsa**

°**M. (Anthedon) compta** Cresson. Howard, Insect Book, Pl. ii, Fig. 24.

°**M. (Florilegus) condigna** Cresson.

M. (Melissodes) desponsa Smith. *M. cnici* Robertson.

Probably occurs throughout the State. Colebrook, 21 July, 1905 (H. L. V.); New Haven, 14 August, 1906 (D. B. Pangburn).

M. (M.) dentiventris Smith.

Doubtless distributed throughout the State. Branford, 3 August, 1904 (H. W. W.); Westville, 3 August, 1905 (W. E B.), on *Veronica;* Rockville, 23 August, 1905 (H. L. V.).

M. (M.) rustica Say. *M. simillima* Robertson. Howard, Insect Book, Pl. iv, Fig. 12.

Occurs with the preceding and has been collected in Connecticut at Rockville and Stafford in August on goldenrod (*Solidago*).

M. (M.) perplexa Cresson. Howard, Insect Book, Pl. iv, Fig. 27.

Probably occurs throughout the State. East Hartford, 9 August, 1904 (P. L. B.); Hartford, 29 August, 1904 (H. L. V.); Salisbury, 27 August, 1904 (W. E. B.).

M. (M.) bimaculata LePeletier. Howard, Insect Book, Pl. iii, Fig. 16.

New Haven, 13 July, 1900; Westville, 22 July, 1906 (W. E. B.).

°**M. (M.) obliqua** Say. Howard, Insect Book, Pl. iv, Fig. 22.

°**M. (M.) agilis** var. **aurigeniæ** Cresson.

Tetralonia Spinola.

Synhalonia Patton.

T. atriventris Smith. Howard, Insect Book, Pl. ii, Fig. 19.

Female: with hair on the inner side of the basal joint of the hind tarsi black or fuscous; hair of thorax above nearly entirely fulvous. Male: clypeus and labrum light; thorax above without dark hair; flagel entirely dark, mandibles without a light spot; abdomen not covered with fulvous hair, the apical part black with dark hair; upper lateral borders of clypeus black, the yellow not notched; hind spurs not in the form of a hook.

New Haven, 4-10 May, 1904 (H. L. V., W. E. B.); Westville, 20 May, 1905 (W. E. B.); Branford, 11 May, 1905 (H. W. W.).

Cemolobus Robertson.

°**C. ipomœæ** Robertson.

Length 13-17 mm. Clypeus trilobate, with a transverse apical whitish band in the male; mandibles with a distinct angle on the outer margin, this angle being spined in the male; hind metatarsi in the male arcuate; female with the second joint of the maxillary palpi nearly as long as the third, fourth, and fifth combined; scopa nearly black.

Visits flowers of the morning-glory (*Ipomœa*); hence its specific name.

Xenoglossa Smith.

X. (Peponapis) pruinosa Say. Pl. x, Fig. 6; Howard, Insect Book, Pl. iii, Fig. 1, Pl. vii, Fig. 2 (the latter erroneously labeled *X. spriuna*).

Length 10-14 mm. Female with its mandibles bidentate at apex; second and third joints of maxillary palpi subequal; second to fourth dorsal abdominal segments with whitish pubescent fasciæ; first cubital cell twice as long as the second, about as long as the third; the first joint of the labial palpi nearly one and one-half times as long as the second. Male with the third joint of the antennæ about one-third as long as the fourth; mandibles tridentate, their base black; clypeus with a yellow spot; labrum black, apex of abdomen without spines.

New Haven, 31 July, 1905 (W. E. B.); Bristol, 28 July, 1906 (W. H. Kelsey). Visits flowers of the pumpkin and other Cucurbitaceæ, and is perhaps the most important agent in pollenizing these plants. It is of interest to know that this bee has been caught sleeping in a closed flower.

EMPHORIDÆ.

The remarks under Euceridæ apply here.

Key to Genera.

Pulvilli present	**Melitoma** p. 734
Pulvilli absent	**Emphor** p. 734

Melitoma Latreille.

Entechnia Patton.

°**M. taurea** Say. Howard, Insect Book, Pl. iii, Fig. 7.

Length 9-14 mm. Female with first cubital cell nearly equalling the third, second short; first recurrent vein received near its end; pubescence pale and mixed with black on dorsum of head and thorax; second to fourth dorsal abdominal segments with white pubescent fasciæ; elsewhere the pubescence is black; third and fourth joints of maxillary palpi ciliate, sixth minute; paraglossæ shorter than the seventh joint of labial palpi, slightly over one-third the length of the second. Male with white pubescent fasciæ on the second to sixth dorsal abdominal segments.

Emphor Patton.

°**E. bombiformis** Cresson.

Length 13-17 mm. Female with the first cubital cell nearly equalling the second and third combined; first recurrent vein received near the middle of the second cubital cell; head, thorax, and sides of the first abdominal segment with pale ochraceous pubescence; the third joint of the maxillary palpi ciliate; paraglossæ setiform, a little longer than the first joint of the labial palpi, which last are one and one-sixth times as long as the second joint. Male with the abdomen not fasciate.

Visits flowers of the morning-glory (*Ipomœa*).

ANTHOPHORIDÆ.

The bees of this group are larger than honey-bees but smaller than bumble-bees. Only one genus occurs in the State.

Anthophora Latreille.*

Key to Species.

Females.

1. Apex of marginal cell reaching costal margin; third submarginal cell not narrower above than below; first recurrent vein received near middle of second cubital cell; nervulus virtually interstitial with basal vein 2

Apex of marginal cell not reaching costal margin, third submarginal cell narrower above than below; first recurrent vein received a little before second transverse cubitus; nervulus inserted before basal vein; mandibles with an internal tooth; third joint of antennæ slightly longer than fourth and fifth combined but shorter than fourth, fifth, and sixth together; pubescence on dorsum of thorax and base of abdomen ochraceous, elsewhere black; length 15 mm. ....**floridana**

2. Knee-plate of hind legs circular or spatulate, mandibles bidentate 3

Knee-plate of hind legs lanceolate; mandibles tridentate; third joint of antennæ nearly equal to fourth, fifth, sixth, and seventh together; pubescence griseous and black, ochraceous or fulvous on fifth and sixth dorsal abdominal segments; second joint of maxillary palpi four or five times as long as first; first joint of labial palpi slightly over five times as long as second; length 11-13 mm. .... **terminalis**

3. Third cubital cell not broader above than below; second joint of maxillary palpi about twice as long as first; third antennal joint longer than combined length of fourth, fifth, sixth, and seventh but shorter than length of these plus length of eighth joint; black, dorsum of thorax and first dorsal abdominal segment with pale pubescence; first joint of labial palpi nearly six times as long as second; length 15-17 mm. ....**ursina**

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* According to the Rules on Nomenclature of the International Zoological Congress, as interpreted by F. D. Morice and John Hartley Durrant, *Anthophora* Latreille should be replaced by *Lasius* Jurine. That change would require *Lasius* Fabricius to be set aside as preoccupied.

Third cubital cell broader above than below; third [illegible] antennæ nearly as long as fourth, fifth, and sixth [illegible]gether; pubescence of thorax and base of abdomen [illegible] or less ochraceous; pubescence elsewhere black or [illegible]ish; second joint of maxillary palpi twice as long as [illegible]

4. Dorsum of thorax with some black hair; at least first [illegible] second dorsal abdominal segments with pale pubescence
Dorsum of thorax without or with little black hair; [illegible] only first dorsal abdominal segment with pale hair; [illegible] joint of labial palpi nearly four times as long as second; length 12-15 mm. .... [illegible]

5. Dorsum of thorax with black hair in center; length 12-15 [illegible] [illegible]
Dorsum of thorax with black hair forming a transverse [illegible] length 12-15 mm. ....bomboides [illegible]

Males.

1. Claw joints of mid legs simple; clypeus entirely yellow [illegible] nearly so ....
Claw joints of mid legs ciliate; face marks, and scape [illegible] front, whitish; clypeus partly black; pygidium rather [illegible]tinct, the area indistinct; third antennal joint longer [illegible] fourth, fifth, and sixth together; mandibles and [illegible] black; pubescence of head and thorax and first dorsal abdominal segment long and griseous or ochraceous mixed with black on vertex and mesonotum; mid [illegible] fimbriate; length 15-16 mm. .... [illegible]

2. Hind metatarsi with a large tooth; apex of labrum [illegible]cave, tufted with black hairs; third antennal joint [illegible] as long as fourth and fifth together; spot on mandibles and scape in front yellow; seventh dorsal abdominal segment without a pygidial area; apex concave, bidentate; pubescence of head, thorax, fore legs, and base of [illegible]men mostly ochraceous; elsewhere mostly black; length 12-14 mm. ....
Hind metatarsi simple; labrum entire ....

3. Only first dorsal abdominal segment with pale pubescence [illegible]
First and second dorsal abdominal segments with pale pubescence; dorsulum without or with few black hairs..bomboides

4. Third antennal joint longer than fourth and fifth combined; seventh dorsal abdominal segments furcate; labrum yellow; mandibles and scape usually black; pubescence griseous, mixed with black above; length 10-11 mm.. [illegible]
Third antennal joint longer than fourth; pygidial area shining; labrum, mandibles, and scape black; dorsum of

thorax and first abdominal segment with ochraceous pubescence .... **floridana**

A. (Emphoropsis) floridana Smith.
New Haven, 28 April, 1902 (W. E. B.).

A. (Clisodon) terminalis Cresson.
Mt. Carmel, 27 August, 1904 (P. L. B.).

°**A. (Anthemoëssa) abrupta** Say. Howard, Insect Book, Pl. iii, Fig. 30.

A. (A.) bomboides Kirby.

°**A. (A.) bomboides canadensis** Cresson.

°**A. (Anthophora) ursina** (Cresson).

HYLÆIDÆ.

This family is represented by one genus, *Hylæus*, which consists of small black bees, with pale, usually yellow, marks.

Hylæus Fabricius.

Prosopis Fabricius.

Key to Species.

Females.

Fore coxæ simple; at least the bases of tibiæ yellowish; propodeum rugose; first to sixth dorsal abdominal segments black.
1. First segment and base of second segment of abdomen black; clavate face mark present 2
First segment and base of second segment of abdomen reddish .... **nelumbonis**
2. Collar black; length 4-5 mm. 3
Collar with yellow marks; tubercles and face marks yellow; length 5-6 mm. 4
3. Clypeus, tubercles, and tegulæ usually with a yellow spot .. **pygmæus**
Clypeus with a subapical yellow band .... **ellipticus**
4. Edge of wing-base and tegulæ black, the latter sometimes with a yellow dot 5
Edge of wing-base and spot on tegulæ yellow .... **ziziæ**
5. Clypeus black 6
Clypeus with a trilobed yellow mark at apical margin.. **varifrons**

6. Enclosure bordered by an impressed line, often obscured by the reticulations; tegulæ rarely with a dot ....modestus
Enclosure bordered by a raised line; tegulæ often with a yellow dot ....affinis

Males.

Fore coxæ simple; propodeum rugose; at least the face, the fore tibiæ in front, and mid and hind tibiæ at base, yellowish.
1. Abdomen black at base; body black; face marks entire; tubercles colored ....
Abdomen reddish at base ....nelumbonis
2. Lateral extension of face marks not ending near eye ......
Lateral extension of face marks ending near eye; collar usually with two lines; length 5-6 mm. ....
3. Lateral extension of face marks usually club-shaped, diverging from eye; scape exteriorly and sometimes a dot on tegulæ pale yellowish; length 4 mm. ....pygmæus
Lateral extension of face marks hook-shaped, diverging from eye; scape black; dot or mark on tegulæ yellow ....verticalis
4. Scape concave exteriorly; tegulæ with a yellow spot ......
Scape not concave exteriorly; tegulæ and mandibles rarely yellow ....
5. Edge of wing-base, labrum, mandibles more or less, often scape exteriorly yellow; face marks club-shaped laterally; yellow maculæ at base and apex of mid tibiæ, united....ziziæ
Edge of wing-base, labrum, mandibles, and scape blackish, or at least not yellow; face marks spear-shaped laterally; yellow only at base of mid tibiæ ....pennsylvanicus
6. Mid and hind tibiæ with a blackish spot behind, hind ones often entirely yellow; first dorsal abdominal segment impunctate; face marks sometimes club-shaped laterally; tegulæ unspotted ....modestus
Mid and hind tibiæ yellow at base; first dorsal abdominal segment impunctate; face marks pointed on eye margin; tegulæ sometimes spotted; wings hyaline ....affinis

H. pygmæus (Cresson).

Occurs throughout the State in May, June, July, and August. Collected at Stafford, Colebrook, New Haven, Branford and Sachem's Head, on flowers of goldenrod and red raspberry.

H. ellipticus (Cockerell).

On flowers of goldenrod. Stafford, 24 August, 1905 (W. E. B.).

H. ziziæ (Robertson).

Hartford (S. N. D.); Milldale, 21 May, 1906 (B. H. W.).

H. modestus (Say). *Prosopis affinis* Smith. *P. illinoiensis* Robertson.

On the wing throughout the state in June, July, and August, on flowers of common meadow-sweet, parsnip, milkweed, goldenrod, and common day-lily. Has been taken at Branford, Colebrook, Green's Farms, Mt. Carmel, New Haven, Sachem's Head, Salisbury, Scotland, Stafford, and Westbrook.

°**H. sayi** (Robertson).

°**H. varifrons** (Cresson).

°**H. verticalis** (Cresson).

°**H. pennsylvanicus** (Cockerell).

°**H. nelumbonis** (Robertson).

COLLETIDÆ.

These bees burrow in the ground to make their nests. At least one of the indigenous species groups its nests into communities which the late Dr. Henry Christopher McCook has called "bee towns." A single genus occurs in the state.

Colletes Latreille.

Key to Species.

Females.

1. Fore coxæ without distinct hairy spines; dorsum of thorax with griseous pubescence, mixed with black 2
   Fore coxæ with distinct hairy spines 4
2. Sixth ventral abdominal segment simple; propodeum truncate and with a transverse series of subquadrate pits; postscutel anteriorly without a transverse series of subquadrate pits; clypeus in profile slightly convex, somewhat sulcate, puncto-striate 3
   Sixth ventral abdominal segment bicarinate; propodeum rounded and with a triangular, reticulated, rugose enclosure; third antennal joint longer than fourth or fifth; malar space one-third as long as wide; length 9-11 mm. **compactus**
3. Malar space more than one-third as long as wide, but shorter than wide; clypeus shining, coarsely puncto-striate; transfacial line longer than facial; length 12-13 mm. ......**inæqualis**

Malar space at least twice as long as wide or longer; facial line longer than transfacial; clypeus sulcate, puncto-striate .... validus

4. Malar space one-fifth to one-fourth as long as wide; length 9-11 mm.; prothorax without strong lateral spines; pubescence of dorsum of thorax not mixed with black; second dorsal abdominal segment minutely punctate or impunctate; wings yellowish; inner claw with a median tooth; pubescence ochraceous .... americanus

Characters mostly as in *americanus*, as described above, but second dorsal abdominal segment rather coarsely punctate; fasciæ narrow; second submarginal cell narrowed about one-half above; claws cleft, the divisions nearly equal .... æstivalis

Males.

1. Fourth antennal joint shorter than second and third combined, not much longer than third 2

Fourth antennal joint as long as second and third combined 3

2. Second to fifth ventral abdominal segments not densely bearded laterally; malar space as in female; head as long as wide; dorsum of thorax with ochraceous pubescence; second submarginal cell not much narrower above than below .... validus

Second to fifth ventral abdominal segments densely bearded; malar space short, nearly as in female of *æstivalis;* second submarginal cell strongly narrowed above; size nearly as in *americanus* .... æstivalis

3. Malar space at least one-half as long as wide 4

Malar space not more than one-third as long as wide; postscutel densely punctate and pubescent; mesonotum rather evenly punctate; prothoracic spines indistinct; pubescence ochraceous; length 8 mm. .... americanus

4. Propodeum as in female; malar space as long as wide; pubescence of dorsulum mixed with black; length 8-9 mm. .. compactus

Propodeum as in female; body black; malar space shorter than wide; length 10-12 mm. .... inæqualis

C. inæqualis Say. *C. propinquus* Cresson. *C. canadensis* Cresson.

New Haven, 4-10 May, 1904 (W. E. B., H. L. V.).

C. validus Cresson.

New Haven, 4-7 May, 1904 (W. E. B., H. L. V.).

C. compactus Cresson.

°**C. americanus** Cresson.

C. æstivalis Patton.

C. sp.

Torrington, 7 July, 1905 (W. E. B.).

STELIDIDÆ.

Black bees, with whitish margins to the dorsal abdominal segments. Represented by a single genus.

Stelis Panzer.

Key to Species.

Females.

Abdomen with narrow, continuous or interrupted whitish fasciæ on its dorsal segments .... **fœderalis**

Abdomen with eight to fourteen whitish spots above .... **lateralis**

Males.

Third ventral abdominal segment with a median apical dentiform carina; first to fifth dorsal segments with narrow, continuous or interrupted whitish fasciæ .... **fœderalis**

Third ventral abdominal segment simple; first to fifth dorsal segments with lateral whitish spots .... **lateralis**

S. (Microstelis) fœderalis Smith. *S. nitida* Cresson.

S. (M.) lateralis Cresson.

MEGACHILIDÆ.

To this family belong the leaf-cutter bees and the bees parasitic upon them, as well as the mason-bees.

Key to Genera.

Females.

1. Abdomen not maculated 2

   Abdomen maculated, claws cleft; abdomen with a scopa; apical tarsal joint with an empodium; mixillary palpi with two joints .... **Dianthidium** p. 752

2. Empodii absent; maxillary palpi 3-jointed; first dorsal abdominal segment with a broad concavity 3

   Empodii present; claws simple; abdomen with a scopa...... 4

3. Abdomen with a scopa; axillæ not produced into spines on each side of scutel .... **Megachile** p. 742

   Abdomen without a scopa; axillæ produced into spines on each side of scutel .... **Cœlioxys** p. 746

4. Black 5
Metallic green, bluish or purplish .... **Osmia** p. 748
5. Vein separating stigma from first submarginal cell longer than vein separating stigma from marginal cell; first dorsal abdominal segment with a narrow sulcus .. **Andronicus** p. 750
Vein separating stigma from first submarginal cell not longer than vein separating stigma from marginal cell; first dorsal abdominal segment subtruncate, with a punctate cavity bounded by a distinct rim .... **Heriades** p. 751

Males.

1. Abdomen not maculated 2
Abdomen maculated; maculations yellow or reddish; apical tarsal joint and maxillary palpus as in female............ **Dianthidium** p. 752
2. Apical tarsal joint without an empodium................. 3
Apical tarsal joint with an empodium..................... 4
3. Axillæ not produced into spines on each side of scutel...... **Megachile** p. 742
Axillæ produced into spines on each side of scutel.. ..... **Cœlioxys** p. 746
4. Black 5
Metallic green, bluish or purplish .... **Osmia** p. 748
5. Vein separating stigma from first submarginal cell longer than vein separating stigma from marginal cell; first dorsal abdominal segment as in female .... **Andronicus** p. 750
Vein separating stigma from first submarginal cell not longer than vein separating stigma from marginal cell; first dorsal abdominal segment as in female .... **Heriades** p. 751

Megachile Latreille.

Leaf-cutter bees that make tubular cells out of nearly semicircular pieces of leaves which they cut from various plants.

Key to Species.

Females.

Mandibles expanded at apex.
1. Abdomen viewed from above, oblong; third joint of maxillary palpi shorter than first and second; second to fourth dorsal abdominal segments without pubescent fasciæ in basal grooves 2
Abdomen viewed from above, cordate with an acute basal tooth 3
2. Cheeks with a large tooth beneath; clypeus with a median teeth .... **pugnata**

Cheeks unarmed; clypeus bisinuate, with a median angle and two teeth on each side; mandibles with four teeth ....**sayi**

3. Mandibles with five teeth; scopa yellow 4

Mandibles with four teeth 8

4. Ventral scopa yellowish; head, thorax, and abdomen with yellowish pubescence, except for some black hairs on dorsum 5

Ventral scopa black and bright golden brownish; head and thorax with white pubescence; first and second dorsal abdominal segments with yellowish white pubescence, succeeding segments with black pubescence ....**melanophea**

5. Apical dorsal abdominal segment without black pubescence.. 6

Apical dorsal abdominal segment with black pubescence 7

6. Apical dorsal abdominal segment with its pubescence all yellow ....**latimana**

Apical dorsal abdominal segment with appressed golden brown pubescence and some basal non-appressed black hairs, length 10 mm. ....**exclamans**

7. Length 12 to 15 mm. ....**vidua**

Length 11 mm. ....**infragilis**

8. Ventral scopa yellowish or white; posterior ocellus not nearer to edge of vertex than to nearest eye margin; disc of sixth dorsal abdominal segment with erect hairs that are more appressed and dense apically; hair of apical dorsal abdominal segment black at base, whitish apically, that segment concave in profile before apical lip; clypeus entire 9

Ventral scopa yellow; disc of apical dorsal abdominal segment straight in profile; hind metatarsi narrower than hind tibiæ ....**mendica**

9. Sixth dorsal abdominal segment finely and closely punctate; pale pubescence white; hair of apical ventral segment black ....**generosa**

Sixth dorsal abdominal segment densely and coarsely punctate; pale pubescence griseous; hair of apical ventral segment usually whitish ....**brevis**

Males.

Mandibles with a large tooth beneath.

1. Fore tarsi flattened; coxal spines distinct; apical joint of antennæ broad and flat; fore tarsi colored 2

Fore tarsi simple, not flattened, black or nearly so 6

2. Fore coxæ with one or more bristles in front; first joint of front tarsi with a boat-shaped scale; lower angle of cheeks grooved and with a distinct posterior spine; sixth dorsal abdominal segment with an ordinary carina; its apical

margin* with a carina on each side, but no spines; apical abdominal segment pointed; claws cleft, with an acute basal tooth; mid metatarsi narrower than tibiæ, more or less colored; fore and mid femora and tibiæ black, or nearly so; fore trochanters and coxæ black; boat-shaped scale somewhat pointed 3

Fore coxæ without bristles in front; front metatarsi without a boat-shaped scale; apical margin of sixth abdominal segment with two teeth on each side; claws without distinct basal teeth; mandibular tooth basal; cheeks beneath with a large scale-like process; front coxæ bare anteriorly, with large apical spines; front tarsi strongly fringed, first joint hollowed out beneath; mid femora enormous; sixth abdominal segment with a strong, deeply notched carina; apical margin with strong median teeth; apical segment outwardly arcuate, sometimes slightly dentate 4

3. Tarsal scale with the tip virtually on a level with the tip of third tarsal joint, edged with a short line of black pubescence; two or three coxal bristles present ....**pugnata**

Tarsal scale with the tip about on a level with the tip of second tarsal joint, edged with fuscous pubescence; four to five coxal bristles present ....**sayi**

4. Apex of abdomen not stylate beneath 5

Apex of abdomen stylate beneath, with three processes, apical dorsal abdominal segment semicircularly emarginate; pubescence as in female ....**melanophea**

5. Dorsum of body with black pubescence confined to third, fourth, and fifth abdominal segments ....**vidua**

Dorsum of body without black pubescence ....**latimana**

6. Coxal spines strongly developed; sixth abdominal segment with carina transverse, strongly notched or denticulated; mandibles tridentate; spines on apical margin of sixth abdominal segment short and more or less concealed 7

Coxal spines wanting; mandibles tridentate; carina on sixth abdominal segment semicircular, entire or nearly so, its edge at most slightly denticulated; apical margin with two lateral teeth; seventh abdominal segment pointed; pubescence mostly pale ochraceous except on dorsum of body, where there is much black pubescence ....**infragilis**

7. Pubescence mixed with black on dorsum; carina of sixth dorsal abdominal segment convex laterally; lateral ocellus not nearer edge of vertex than to nearest eye; carina of sixth dorsal abdominal segment with its margin jagged;

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* This is beneath and anterior to what is superficially the apical margin of the jagged or emarginate crest of the sixth dorsal abdominal segment.

margin of this segment with four teeth; seventh abdominal segment pointed; front tarsi strongly ciliate 8

Pubescence pale yellowish or griseous, rarely mixed with black; sixth dorsal abdominal segment with a jagged carina, its middle usually notched, its apical margin with a lateral tooth and an inner dentiform carina nearer to the lateral tooth than to its fellow of the opposite side .....**brevis**

8. Pubescence white; median tooth of sixth abdominal segment nearer to the lateral one than to its fellow of the opposite side ....**generosa**

Pubescence more ochraceous; median tooth of sixth abdominal segment nearer to its fellow than to the lateral one **mendica**

°**M. (Sayapis) pugnata** Say.

°**M. (S.) sayi** Cresson. ***M. inimica*** Cresson. Howard, Insect Book, Pl. iii, Fig. 4.

°**M. (Xanthosarus) melanophea** Smith.

M. (X.) latimana Say. Pl. x, Fig. 1; Howard, Insect Book, Pl. i, Fig. 23.

Occurs along the coast. New Haven, 20 June, 1902 (E. J. S. M.); Sachem's Head, Guilford, 1 August, 1904 (H. L. V.); Branford, 29 July, 1905 (H. W. W.).

***M. (X.) exclamans.** Viereck.

Type-locality: West Thompson, 12 July, 1905 (H. L. V.); also from Stafford, 24 August, 1905 (W. E. B.), on goldenrod or sunflower.

M. (Delomegachile, new subgenus) vidua Smith. ***M. frigida*** Smith.

Branford, 15 July 1904 (H. W. W.).

M. (Anthemois) infragilis Cresson. Howard, Insect Book, Pl. iii, Fig. 12.

Along the coast. Taken on milkweed and burdock (*Arctium lappa*) flowers. Branford, 3, 11, 22 August, 1904 (H. W. W.); Sachem's Head, Guilford, 1 August, 1904 (H. L. V.).

M. (Megachile) mendica Cresson. Howard, Insect Book, Pl. iv, Fig. 25.

North Haven, 3 August, 1905; Westbrook, 30 August, 1904 (H. L. V.).

°**M. (M.) generosa** Cresson.

M. (M.) brevis Say. Howard, Insect Book, Pl. iii, Fig. 5. Occurs all over the State, from June to September. Has been taken at Branford, New Canaan, New Haven, North Haven, Poquonock, Rockville, Sachem's Head, Salisbury, Scotland, and Stafford, on sunflower, goldenrod, and milkweed flowers.

Cœlioxys Latreille.

This genus of bees is parasitic upon species of the preceding genus.

Key to Species.

Females.

1. Clypeus convex 2
   Clypeus bilobed; sixth abdominal segment rather abruptly narrowed ....**sayi**
2. First dorsal abdominal segment with apical fasciæ, edge of its concavity hardly carinate; scutel rounded or with a blunt tubercle; second to fourth dorsal abdominal segments without oblique basal fasciæ 3
   First dorsal abdominal segment with apical fasciæ, edge of its concavity carinate 6
3. Sixth dorsal abdominal segment slightly sinuate laterally.. 4
   Sixth dorsal abdominal segment strongly, abruptly narrowed; legs black; tarsi red ....**dubitata**
4. Legs black 5
   Legs red ....**octodentata**
5. Dorsulum dull ....**mœsta**
   Dorsulum shining ....**lucrosa**
6. Sixth dorsal abdominal segment curved downward and drawn out into a rounded spine 7
   Sixth dorsal abdominal segment with a straight terminal spine; corresponding ventral segment broadly rounded, mucronate, brownish ciliate ....**lucrosa**
7. Sixth ventral abdominal segment curved at right angles to its basal half, mucronate, yellowish ciliate ....**mœsta**
   Sixth ventral abdominal segment arched, mucronate, yellowish ciliate ....**dubitata**

Males.

1. Cheeks with posterior inferior angle beveled or grooved; second and third dorsal abdominal segments without basal fasciæ; fifth segment with lateral apical spines; sixth with two lateral and four terminal spines, median sulcus about one-third the width of the segment; scutel rounded or with a slight median tubercle; first dorsal abdominal segment with apical fasciæ, edge of concavity hardly carinate 2

Cheeks beneath punctate, concave, their posterior edge carinate 5

2. Beveled portion of cheeks rather opaque and rough; disc of abdomen opaque, densely punctate, deep transverse basal sulcus on second segment; fourth ventral segment bidentate, legs black 3

Beveled portion of cheeks shining; impunctate; fourth ventral abdominal segment entire 4

3. Tarsi red ....**dubitata**

Tarsi black ....**dubitata** var. **melanopoda**

4. Disc of abdomen shining, rather sparsely punctate, sulcus on its second dorsal segment rather shallow; legs black, tibiæ and tarsi more or less tinged with red ....**sayi**

Disc of abdomen opaque, densely punctate, sulcus on its second segment rather deep; legs reddish ....**octodentata**

5. Second and third dorsal abdominal segments without basal pubescent fasciæ, fifth with rudimentary lateral spines, sixth with two lateral and four terminal spines, median sulcus about one-third the width of the segment; femora blackish brown, tibiæ and tarsi more brownish ....**sodalis**

Second and third dorsal abdominal segments with basal interrupted pubescent fasciæ, fifth with lateral spines, sixth with two lateral and four terminal spines, median sulcus about one-third the width of the segment; legs black; fourth ventral abdominal segment not spinose ....**lateralis**

C. sayi Robertson.

New Haven, 20 June, 1902 (E. J. S. M.); New Canaan, 14 September, 1905 (B. H. W.).

°**C. lucrosa** Cresson.

***C. mœsta** Cresson.

Type locality: Connecticut (E. N.).

C. dubitata Smith. *C. rufitarsus* Smith. Howard, Insect Book, Pl. iv, Fig. 10.

New Haven, 20 July, 1904; 8 October, 1903 (W. E. B.); 16 October, 1903 (H. L. V.).

***C. dubitata** var. **melanopoda** Viereck (new variety).

Type-locality: New Haven, 17 June, 1905, on flowers of wild red raspberry (*Rubus strigosus*) (H. L. V.).

C. octodentata Say. Howard, Insect Book. Pl. iii, Fig. 10.

North Haven, 3 August, 1905, on flowers of *Pycnanthemum;* Westbrook, 30 August, 1904, on goldenrod (H. L. V.); Branford, 22 August, 1904 (H. W. W.).

°C. **sodalis** Cresson.

°C. **lateralis** Cresson.

Osmia Panzer.

The bees of this genus are known as mason-bees, owing to the fact that they construct nests of clay and sand in the interstices of stone walls, old fence-posts, trunks of trees, etc.

Key to Species.

Females.

1. Malar space distinct; ventral scopa black; face with or without some black hairs; that section of subdiscoidal vein forming lower border of third discoidal cell longer than principal section of vein separating first and second discoidal cells 2

Malar space wanting; mandibles simple at base 4

2. Clypeus entire 3

Clypeus with a large subquadrate emargination, with dentiform lateral angles; malar space posteriorly with a large compressed tubercle; mandibles with a large triangular inner tooth; basal vein received beyond nervulus......**lignaria**

3. Clypeal margin produced and thickened; mandibles tridentate, with a transverse basal carina; basal vein received before nervulus ....**bucephala**

Clypeal margin not thickened or produced; mandibles quadridentate, with a transverse basal depression; basal vein received a little beyond nervulus ....**purpurea**

4. Front without tubercles 5

Front with two tubercles, one above the other; mandibles tridentate; clypeus with a shining, somewhat concave, edge; basal vein not received before nervulus; scopa white .. **conjuncta**

5. Ventral scopa white or yellowish 6

Ventral scopa black; head with pale pubescence............ 9

6. Scopa white; mandibles quadridentate or tridentate 7

Scopa yellowish; mandibles quadridentate; basal vein received before nervulus ....**distincta**

7. Basal vein not received before nervulus 8

Basal vein received before nervulus; clypeus rather distinctly emarginate, with a rather dense apical fascia of dull whitish pubescence; front usually with an opaque blackish patch **canadensis**

8. Clypeus subquadridentate, with a median emargination and two lateral teeth .... **albiventris**

Clypeus entire; scopa sometimes blackish on fifth and sixth ventral segments; ventral scopa white .... **pumila**

9. Mandibles quadridentate; length 11 mm. .... **major**

Mandibles tridentate; length 8 mm. .... **atriventris**

Males.

1. Apical margin of seventh dorsal abdominal segment entire or slightly emarginate, of sixth entire 2

Apical margin of seventh dorsal abdominal segment bidentate 4

2. Mid tarsi simple 3

Mid tarsi broad, 3-sided; third antennal joint as long as fourth; hind metatarsi arcuate, clavate; hind spur twice as long as its fellow .... **bucephala**

3. Mid femora produced beneath; fourth antennal joint as long as second and third combined; hind metatarsi toothed beyond middle; pubescence mixed with black .... **lignaria**

Mid femora simple; third antennal joint longer than fourth; pubescence pale .... **albiventris**

4. Sixth dorsal abdominal segment more or less notched medially, not strongly sinuate or dentate; first ventral segment entire 5

Sixth dorsal abdominal segment entire medially, strongly sinuate and strongly dentate laterally; front with two tubercles, one above the other .... **conjuncta**

5. Antennæ filiform 6

Antennæ moniliform; hind metatarsi arcuate, clavate. .**simillima**

6. Hind metatarsi simple 7

Hind metatarsi dentate near middle of inner margin; hind spurs equal in length, and nearly one-half length of hind metatarsi .... **vicina**

7. Sixth dorsal abdominal segment strongly notched; dull greenish 8

Sixth dorsal abdominal segment at most with a shallow notch; brassy green; margin of sixth abdominal segment stramineous .... **pumila**

8. Length more than 7.5 mm. 9

Length less than 7.5 mm., or 6.5-7 mm. .... **rustica**

9. Length 10 mm. .... **major**

Length 8 mm. .... **atriventris**

O. (Ceratosmia) lignaria Say.

Has been captured in New Haven, 25 May, 1904 (B. H. W.), 4 May, 1904 (H. L. V.), and in Branford, 8, 11, 26, 29 May, 1905 (H. W. W.), visiting apple and quince blossoms.

°**O. (Centrosmia) bucephala** Cresson. *O. latitarsis* Cresson.

O. (Osmia) pumila Cresson.

New Haven, 17 June, 4 July, 1905 (H. L. V.). Visits flowers of the red raspberry.

O. (O.) major Robertson.

New Haven, 9 June, 1905 (B. H. W.); Branford, 3 July, 1906, (H. W. W.), visiting flowers of honeysuckle (*Lonicera fragrantissima*).

O. (O.) simillima Smith.

***O. (O.) atriventris** Cresson.

Farmington (?); Berlin, 30 June, 1905 (W. E. B.).

O. (O.) rustica Cresson.

Branford, 29 May, 1905 (H. W. W.), on lilac blossoms.

°**O. (O.) vicina** Cresson.

***O. (O.) purpurea** Cresson.

Farmington (?).

***O. (Nothosmia) distincta** Cresson. Howard, Insect Book, Pl. iii, Fig. 13.

Farmington (?).

°**O. (Monilosmia) canadensis** var. **cognata** Cresson. Howard, Insect Book, Pl. iii, Fig. 18.

***O. (Diceratosmia) conjuncta** Cresson. *O. quadridentata. O. cressoni.*

***O. (Leucosmia) albiventris** Cresson.

Andronicus Cresson.

To this group belong black, slender species.

Key to Species.

Females.

1. Mandibles tridentate; clypeus coarsely punctate; ventral scopa whitish 2
   Mandibles quadridentate; clypeus finely punctate; ventral scopa yellowish .... **cylindricus**

2. Scutel swollen; head beneath smooth, shining, impunctate, edge of cheeks beneath with a row of long incurved hairs; clypeus with a median raised line .... **truncatus**
   Scutel convex; head beneath punctate, long, pilose; clypeus without a raised line .... **productus**

Males.

1. Fourth to twelfth antennal joints broader than long, apical joint produced to a point; sixth dorsal abdominal segment with lateral apical spines 2
   Fourth to seventh antennal joints dilated, eighth and ninth broader than long, tenth to thirteenth longer than broad; seventh dorsal abdominal segment rounded, a little dilated, foveate; first ventral segment produced to a spine, second broad and concave, fourth with visible apical lateral angles **cylindricus**
2. Seventh dorsal abdominal segment not broadly rounded 3
   Seventh dorsal abdominal segment broadly rounded, second ventral segment longest, with a transverse subapical ridge **truncatus**
3. Seventh dorsal abdominal segment produced into a spine; second ventral abdominal segment with a great tooth-like process .... **productus**
   Seventh dorsal abdominal segment produced into a stylus which in outline is finger-shaped; second ventral abdominal segment simple, convex, somewhat swollen ....**pilosifrons**

***A. (Andronicus) cylindricus** Cresson.

Farmington (?).

A. (Alcidamea) truncatus Cresson.

New Haven, 28 June, 1902 (E. J. S. M.); West Thompson, 12 July, 1905 (H. L. V.).

A. (A.) productus Cresson.

New Haven, 24 June, 1902 (E. J. S. M.), 17 June, 1905 (H. L. V.); Poquonock, 27 June, 1905, West Thompson, 12 July, 1905 (H. L. V.).

***A. (A.) pilosifrons** Cresson.

Heriades Spinola.

A single species of this genus occurs in the State, and this, like allied forms, is black and covered with pale pubescence.

H. (Trypetes) carinatus Cresson.

Female with the lower border of the mandibles simple, not sinuate; clypeus emarginate, its sides with two or three denticles.

Male with the second ventral abdominal segment subtruncate; third antennal joint about one-half as long as the fourth; legs stramineous; clypeus bearded.

Occurs all over the State in June, July, and August. Has been taken at Branford, Sachem's Head, Prospect, and Putnam.

Dianthidium Cockerell.

The French call the species of this genus "resinieres" because they use resin in cementing fragments to form their nests.

Key to Species.

Females.

Vertex black; face, clypeus, thorax, legs, and abdomen maculated with yellow; first to fifth dorsal abdominal segments each with a lateral transverse fascia which is indented posteriorly except on first segment; first segment with an additional median transverse fascia; apex of clypeus simple .... simile

Vertex with a transverse reddish or yellowish band along its posterior margin; face with a stramineous portion that is partly yellowish stramineous, partly reddish stramineous or yellow, on each side of the black, partly yellow clypeus; rest of head black; thorax with yellowish or reddish maculæ; legs entirely, or almost entirely, yellowish or reddish; first dorsal abdominal segment with a yellow or reddish mark on each side, second with an interrupted fascia, third, fourth, and fifth divided into three parts by a nearly quadrate yellow mark on each side .... notatum

Males.

Sixth dorsal abdominal segment with an abbreviated, imperfect, median raised line just at apex of segment; its apical margin not toothed; seventh in form of an oblong plate, which is prolonged to form an apical, short, rounded production of apical margin of segment, which is emarginate on each side of this apical process; maculated like the female; in addition, clypeus all yellow, mandibles maculated, and seventh dorsal abdominal segment mostly yellow .... simile

Sixth dorsal abdominal segment and other parts maculated essentially as in the female of *notatum* .... notatum

D. simile Cresson.

Farmington ?

D. notatum Latreille.

Sachem's Head, 1 August, 1904 (H. L. V.).

CERATINIDÆ.

These are the small carpenter-bees, represented in this State by a single genus and two species.

Ceratina Latreille.

Key to Species.

Females.

Length 7-8 mm., bluish green, wings faintly smoky; tubercles white or cream color; without a pale lateral face mark.

Males.

Apical abdominal plate not subacute, lip-like in outline; tubercles pale, white or cream-color; mandibles dark at base; anterior tibiæ blue in front, light stripe on outer side poorly defined or absent; face and disc of dorsal abdominal segments closely punctate .... **dupla**

Apical plate of abdomen subacute; tubercles as in *dupla;* brassy green; arms of clypeal mark about equal; anterior tibiæ with a white line extending their entire length; length 5-6 mm .... **metallica**

C. dupla Say. Howard, Insect Book, Pl. i, Fig. 25.

Occurs all over the State in May, June, July, and August, replacing the pith of elder, etc., with its cells, and visiting flowers of the red raspberry and goldenrod. Has been taken at Branford, New Haven, Colebrook, Prospect, Stafford, and Stonington.

C. metallica H. S. Smith. The females of this species appear to be indistinguishable from the females of *dupla.*

Plantsville, 15 October, 1906 (A. R. Selig).

XYLOCOPIDÆ.

This family is represented in Connecticut by a single species, the well-known carpenter-bee, which sometimes makes itself disliked by tunneling in posts used to support buildings.

Xylocopa virginica Drury. Pl. x, Fig. 2.

Superficially like *Bremus impatiens,* but the male has a "white face." No doubt occurs throughout the State from May to October. Visits apple blossoms. Branford, New Haven, and Hartford.

APIDÆ.

This family consists of the well known honey-bees and bumble-bees.

Key to Genera.

1. Hind tibiæ with two apical spurs 2
Hind tibiæ without apical spurs ....Apis p. 760
2. Females and workers 3
Males 5
3. Hind tibiæ more or less concave, bare, with hairs along the margin forming a pollen-basket or corbicula 4
Hind tibiæ convex, evenly hairy.................Psithyrus p. 759
4. Ocelli above the narrowest part of the front, the lateral ones about as far from the eyes as from each other ..Bremus p. 754
Ocelli in the narrowest part of the front, the lateral ones farther from each other than from the eyes ...Bombias p. 758
5. Malar space about as long as wide; ocelli vertical, the lateral ones about as far from the eyes as from each other; third antennal joint shorter than the fifth 6
Malar space much shorter than wide; ocelli frontal, the lateral ones less than their diameter from the eyes; vertex depressed, third antennal joint in length equalling or exceeding fifth ....Bombias p. 758
6. Outer face of hind tibiæ wth hair not much shorter than that of posterior border 7
Outer face of hind tibiæ bare or nearly so, posterior border with long hair ....Bremus p. 754
7. Vertex with black pubescence; a band of black pubescence between wings ....Bremus p. 754
Vertex with yellow pubescence, or with most of its hair black; with or without a band of black pubescence between wings ....Psithyrus p. 759

Bremus Panzer.

Bombus Latreille.

To this and the succeeding genus belong the most conspicuous of the local wild bees. These are usually called "bumble-bees," though in Europe there are species of *Bremus* that are called "carder bees." All of them live in nests usually constructed underground in meadows, pastures, and other localities, each nest containing many workers, females, and males. Bumble-bees are frequent visitors of various flowers and they store a small amount of honey in a comb of few cells. The carder bees or carding bees are so called owing to their interesting habit of carding and plaiting the moss with which they build their nests. It is said that, when in the act of building, these bees form a line from the site of the prospective nest to the moss supply, all facing the moss; the first bee bites off a piece of the moss, cards and rolls it with its jaws and feet, then passes it on to the second bee, where it is again manipulated and passed to the third; and so it goes along the line until it reaches the nest, where it is incorporated with wax into a dome-like structure. No such habits have as yet been observed in connection with our native species.

Key to Species.

Females and Workers.

1. Vertex with black pubescence like mesonotum 2
Vertex with yellow pubescence like mesonotum 7
2. Mesonotum with a band of yellow pubescence in front; base of labrum as in *vagans* 3
Mesonotum with yellow pubescence, and some black hairs in center; base of labrum with two elevations; other pubescence similarly colored to pubescence in var. *consimilis*....**vagans**
3. Scutellar hairs pale 4
Scutellar hairs black, sometimes mixed with yellow; second and third dorsal abdominal segments with yellow pubescence 6
4. Scutellar hairs yellow 5
Scutellar hairs yellow with the exception of an admixture of black hairs; first and fourth dorsal abdominal segments with yellow pubescence, second and third with orange, fifth and sixth with black, and venter with black pubescense; malar space as long as wide ....**ternarius**
5. First to fourth dorsal abdominal segments with yellow pubescence; malar space slightly longer than wide..........**fervidus**
First dorsal abdominal segment with yellow pubescence, second with pubescence yellow and brownish; malar space wider than long ....**affinis**
6. Apical dorsal abdominal segment with blackish pubescence, first segment with yellow pubescence, mixed with black on lateral basal angles, or entire basal portion black, apical margin always with yellow hairs more abundant in middle **pennsylvanicus**
Apical dorsal abdominal segment with yellow hairs, basal segment with black pubescence ....**terricola**
7. First dorsal abdominal segment not the only dorsal segment with yellow pubescence; malar space as long as or longer than wide 8
First dorsal abdominal segment only with yellow pubescence; disc of mesonotum with black hairs; labrum with a basal

ridge forming a subquadrate sinus nearly reaching apical margin; malar space shorter than wide ....**impatiens**

8. First, second, and third dorsal abdominal segments with yellow pubescence; fourth segment in addition sometimes with all or most of its pubescence yellow 9

First and second dorsal abdominal segments, only, with more or less yellow pubescence; mesonotum with some black hairs; base of labrum with two tubercles or elevations.. 10

9. Labrum bituberculate ....**perplexus**

Labrum not bituberculate but medially impressed ....**borealis**

10. Second dorsal abdominal segment with yellow hairs on basal middle ....**bimaculatus**

Second dorsal abdominal segment with yellow pubescence throughout except sometimes apically, where it may be more or less black.....................**vagans** var. **consimilis**

Males.

1. Hind tibiæ rather evenly covered with short hair; antennæ with fifth joint nearly as long as third and fourth combined; vertex with black pubescence, a band of black hairs on mesonotum between insertion of wings 2

Hind tibiæ with short, sparse hair on outer face, posterior border with its hair as long as diameter of joint 5

2. First to fifth dorsal abdominal segments not all with yellow pubescence 3

First to fifth dorsal abdominal segments with yellow pubescence 4

3. First to fourth dorsal abdominal segments with yellow pubescence, fifth, sixth, and seventh with their pubescence black or fulvous, or yellow with fulvous at tip, yellow with black at tip, or black with fulvous at tip......**pennsylvanicus**

First dorsal abdominal segment apparently alone with yellow pubescence (sometimes there is some yellow pubescence at the base of second segment) ....**impatiens**

4. Sixth and seventh dorsal abdominal segments with black pubescence in middle, apex with black pubescence...**borealis**

Sixth and seventh dorsal abdominal segments with all pubescence black ....**fervidus**

5. Vertex with part or all of its hair black 6

Vertex with yellow pubescence; first, second, and third dorsal abdominal segments with yellow pubescence, fourth with yellow or black pubescence, next two segments with most or all of their hair black, apex of dorsum of abdomen with pale hairs; venter with pale pubescence ....**perplexus**

6. Vertex with its hair partly black......................... 7

Vertex with all of its hair black; mesonotum with yellow pubescence and a transverse band of black pubescence;

first and second dorsal abdominal segments with yellow hairs, apex with black pubescence .... **affinis**

7. Mesonotum with its yellow pubescence not restricted to anterior half 8

Mesonotum with yellow pubescence only in front; second and third dorsal abdominal segments and apex of abdomen with yellowish pubescence .... **terricola**

8. Mesonotum with yellow pubescence throughout; first, fourth, and fifth dorsal abdominal segments with some or all of their pubescence yellow, second with most of its hairs yellow, those at extreme sides black, apex of abdomen with black pubescence above, venter with most of its pubescence pale yellow .... **bimaculatus**

Mesonotum with a transverse band of black pubescence; first to fourth dorsal abdominal segments with yellow pubescence, fifth mostly with yellow, sixth and seventh with black, second and third with orange pubescence, venter with pale pubescence .... **ternarius**

B. vagans Smith. Howard, Insect Book, Pl. ii, Fig. 10.

Occurs throughout the State, from May to September. Branford, Colebrook, Prospect, Stonington.

B. vagans var. **consimilis** Cresson.

Occurs all over the State in May, June, July and August. Visits apple blossoms.

B. fervidus Fabricius.

New Haven, Branford, East Hartford, Mt. Carmel, Salisbury, Torrington, and Milford, in May, June, July, and August (E. J. S. M., H. W. W., W. E. B., P. L. B., H. L. V.).

B. affinis Cresson. Howard, Insect Book, Pl. ii, Fig. 6.

Occurs throughout the State. Branford, Colebrook, New Haven, and Salisbury.

B. ternarius Say. Howard, Insect Book, Pl. i, Fig. 26.

Recorded from the State, but is probably confined to the more northern and elevated portions, as it belongs to the Canadian fauna.

B. pennsylvanicus Degeer. *B. americanorum* Fabricius. Howard, Insect Book, Pl. i, Figs. 30 and 31.

Seems to fly in all parts of the State from May to August inclusive.

B. terricola Kirby. Pl. x, Fig. 8; Howard, Insect Book, Pl. ii, Figs. 1 and 5.

Branford, 15 May, 1905 (H. W. W.); Colebrook, 21 July, 1905 (H. L. V.).

B. impatiens Harris. *B. virginicus* Fabricius. Pl. x, Fig. 11.

Occurs throughout the State from April to September. Branford, New Haven, Putnam and Salisbury.

***B. perplexus** Cresson.

Branford, 29 July, 1905 (H. W. W.); Westville, 13 May, 1905 (W. E. B.).

°**B. borealis** Kirby.

***B. bimaculatus** Cresson. Howard, Insect Book, Pl. ii, Figs. 4 and 8.

New Haven, 13, 27 June, 1902 (E. J. S. M.), 3 June, 20 July, 1904, 11 May, 1905 (W. E. B.); Branford, 8, 11, 29 May, 1905 (H. W. W.); Southington, 11 July, 1904 (W. E. B.).

Bombias Robertson.

This genus greatly resembles *Bremus*, from which it was segregated in 1903. Two species are found in Connecticut.

Key to Species.

Females.

Lateral ocellus nearly equidistant from eye and supra-orbital line; front of thorax yellow; labrum with a transverse interrupted ridge at base; third antennal joint as long as fourth and fifth joints combined, fourth and fifth being equal; vertex yellow or with two yellow lines or tufts; scutel yellow or black, or mixed; first abdominal segment in middle always black, hairs often extending over base of second; second and third segments yellow; malar space about as long as wide .... **auricomus**

Lateral ocellus about twice as far from eye as from supra-orbital line; thorax yellow, its disc mixed with black pubescence; first dorsal abdominal segment and middle of basal part of second yellow, sometimes inclining to reddish; malar space shorter than wide .... **separatus**

Males.

Ocelli located in narrowest part of front; malar space about one-third as long as wide; third antennal joint equal in length to fifth; pubescence of first dorsal abdominal segment and base of second, and on mesonotum, mostly or entirely yellow ....**separatus**

Ocelli located below narrowest part of front; malar space approximately one-half as long as wide; third antennal joint equal in length to fourth and fifth joints combined; mesonotum, first, second, and third dorsal abdominal segments and sometimes fourth also, with part or all of their pubescence, yellow ....**auricomus**

B. separatus Cresson.

New Haven, May, 1903 (W. E. B.).

B. auricomus Robertson.

Branford, 22 May, 1905 (H. W. W.).

Psithyrus LePeletier.

In this genus we have the false or parasitic bumble-bees. They have no workers, only queens and males, and live at the expense of their hosts, the true bumble-bees.

Key to Species.

Females.

1. Abdomen finely punctate 2

Abdomen coarsely punctate; pubescence long, coarse, blunt; third dorsal segment usually, first, second, and fourth often, more or less yellow laterally; pleuræ yellow; mesonotum yellow, often with some black hairs on its disc **laboriosus**

2. Abdominal pubescence short, fine, black, rarely a little yellow on lateral apical margins of fourth dorsal segment; pleuræ and space between wings with black pubescence ...**variabilis**

Abdominal pubescence long, 1 mm. or nearly 1 mm. in length, black except on third and fourth dorsal segments, on the former of which part of the pubescence is pale yellowish, and, on the latter, it is all yellowish; pleuræ and posterior half of dorsum of thorax with black pubescence; wings brownish ....**ashtoni**

Males.

1. Pleuræ entirely covered with yellow pubescence; fourth dorsal abdominal segment covered with entirely black pubescence 2

Pleuræ at least partly covered with dark brown or black pubescence 3

2. Dorsulum with black hairs in center ....**laboriosus**

Dorsulum with a transverse band of black pubescence....
laboriosus var. contiguus

3. First dorsal abdominal segment covered with yellow pubescence .... **ashtoni**
First dorsal abdominal segment entirely dark .... **variabilis**

P. laboriosus Fabricius. *P. citrinus* Smith. Howard, Insect Book, Pl. ii, Fig. 22.

Branford, 3 August, 1905 (H. W. W.); Salisbury, 30 August, 1904 (W. E. B.).

***P. laboriosus** var. **contiguus** Cresson.

P. ashtoni Cresson.

New Haven, 4 July, 1905 (H. L. V.).

***P. variabilis** Cresson. Howard, Insect Book, Pl. iii, Fig. 35.

Apis Linnaeus.

The bees of this genus are regarded as the most highly developed, not only of the Hymenoptera, but of all insects. *A. mellifera* Linnaeus and its varieties, commonly known as the honey-bee, furnish the honey and wax of commerce and were all introduced into America from various parts of Europe.

Many volumes have been published about honey-bees, and it is unnecessary to discuss them here at great length. The reader is referred to Maeterlinck's "Life of the Bee" for a popular account, and to Farmers' Bulletin No. 447, United States Department of Agriculture, for an introduction to the vast technical literature on this subject.

A. mellifera Linnaeus. *A. mellifica* Linnaeus. Honey-bee. Pl. x, Fig. 3.

Domestic and wild swarms found throughout the State. Visits many flowers, including apple, pear, peach, and blackberry.

Howard, Insect Book, gives the following illustrations:

Head and tongue of worker bee	Fig. 1, p. 4.
Heads of queen and drone	Fig. 2, p. 5.
Queen cells and worker brood	Fig. 3, p. 7.
Queen honey-bee	Fig. 4, p. 7.
Legs of different bees	Fig. 5, p. 8. Fig. 6, p. 9.

APPENDIX.

Since the manuscript of this bulletin was sent to the printer it has been learned that the following additional species occur in Connecticut. They are included here in order to make the work more complete.

TENTHREDINOIDEA.

TENTHREDINIDÆ.

Diprion simile Hartig. *Lophyrus similis.*

A robust species from Europe, the larvæ feeding upon leaves of various species of pine. First discovered in this country at New Haven in 1914, and has apparently become established here. For a full account of habits, life history, and parasites of this species, see Journal of Economic Entomology, viii, 379; Report of Connecticut Agricultural Experiment Station for 1915. The following description of the adults was printed in Journal of Economic Entomology, viii, 380:—

"Male: Wing-spread, 14 mm. ($\frac{9}{16}$ inch). Length, 7 mm. Large pectinate antennæ. Head and pronotum coarsely punctured. Head, antennæ and body, black. Cerci and tip of the last abdominal segment, orange. Legs yellow, with the trochanters and basal two-thirds of the femora, brownish black.

"Female: Wing-spread, 20 mm. (little over ¾ inch). Length, 8 mm. ($\frac{5}{16}$ inch). Robust, head and antennæ black. Thorax coarsely punctured, yellow with a large shield-shaped black spot on mesothorax, extending from the interior margin and covering about two-thirds of the space between the parapsidal grooves. On either side are a pair of L-shaped black marks which approach each other posteriorly. Posterior margin of the mesothorax, postscutellum and prosternum, black. Abdomen yellow with dorsal surface of 3d, 4th, 5th, 6th, and the anterior portion of 7th segment, black. Legs yellow with the outer surface of hind femora, the apex of the middle and hind tarsi, dark."

New Haven, 27 August, 1914 (W. E. B.); Derby, 11 June, 1915 (M. P. Zappe); New Canaan, 24 June, 1915 (Q. S. Lowry and M. P. Zappe); Hartford, 28 June, 1915 (Q. S. Lowry); Greenwich, 24 September, 1915 (M. P. Zappe).

(See page 43 for key to other species of *Diprion.*)

Emphytus cinctus Linnæus. European Rose Sawfly.

This species feeds upon rose and raspberry in Europe, and the larvæ have been found many times in the pith of cut stems of manetti rose stock imported into Connecticut from France and England. It may become established in this country.

The following description is copied from F. V. Theobald's Insect Pests of Fruits, page 435: —

" Adult 12 to 14 mm. General colour shiny black; head black, with fuscous grey down; palpi and labrum black, but the latter may be pale grey, and also the apex of the former; the nine-jointed antennæ are deep black. Thorax black, with two round yellow to white spots, placed posteriorly.

" Abdomen shiny black, a small but distinct pale blotch on the middle of the posterior of the first segment; the fifth segment has a dull white to bright white basal band spreading out at the sides and passing ventrally; the apex is hairy, curved and projecting. Legs, with the anterior and mid coxæ and trochanters black and testaceous; the hind coxæ and trochanters yellowish-white; the fore and mid femora are black, except at the apex where they are testaceous or reddish, in the hind femora the base is white; tibiæ and tarsi brick-dust red, but the tarsi show fuscous shades, especially apically.

" Wings hyaline, with a small pale basal spot; costa reddish brown to brown; stigma black apically.

" The male is much like the female, but has no pale area on the fifth segment, the whole being shiny black; the antennæ are very similar but a trifle thicker; the hind femora are entirely dark, and the palpi are quite white apically."

(See page 55 for key to other species of *Emphytus.*)

***Tenthredo lobata maculosa** Smulyan.

This subspecies was described in Canadian Entomologist, volume xlvii, p. 324, 1915, as follows:—

"**Tenthredella lobata** (Norton), subspecies **maculosa** Smulyan.

"*Allantus lobatus* var. a. Norton, Bost. Journ. Nat. Hist., vii, 1860, p. 253, n. 32, 8°.

Tenthredo lobatus var. a. Norton, Trans. Am. Ent. Soc., ii, 1868-69, p. 229, n. 6, 8°.

"Norton's specimen of var. a, as far as I know, is lost, but there is an authentic female specimen from Connecticut in the Norton Collection in the Peabody Museum, Yale University. Can this specimen be the original one?

"Female.— Differs from *lobata lobata* as follows:—

"Head.— A yellowish, or yellowish white spot, or longitudinal line usually on the posterior portion of the vertex plate on each side, very often a minute elongate spot at the terminus of each arm of the epicranial suture; the black spot on the posterior half of the cheek sometimes coalesces with that along the upper part of the eye; basal segment of antennæ usually black inside, and the yellowish line outside sometimes absent. Supraantennal ridges from moderately prominent to prominent.

"Thorax.— Margin of pronotum not interrupted anterodorsally; V-spot on prescutum very often not complete posteriorly; the following additional parts yellow or yellowish white,— a short longitudinal line on the mesoscutum on each side of the posterior portion of the prescutum, a triangular spot at the posterior end of the mesoscutum immediately in front of each anterior angle of the mesoscutellum, the anterior margin of the mesoscutellum in part (rarely), a small spot on the metascutum behind and under each cenchrus, and the greater mesal upper half of the metapostscutellum; as a rule only a small spot at the upper anterior angle of the mesoepisternum, and very often a small yellowish white, or straw-colored spot at the posterior end of the pectus on each side of the median longitudinal suture. Mesoscutellum from slightly to moderately convex; mesepisternum from moderately to fairly sharply pointed.

"Abdomen.— Venter with only the pleura straw-color.

"Legs.— Trochanters black above, sometimes almost entirely; anterior femora usually black behind; very frequently intermediate femora black except more or less before; the black on apical portion of posterior tibiæ often more extensive above — about half-way up towards base.

"Wings.— Fore wings sometimes hyaline; costa not brown.

"Described from a type and five paratypes, the female in the Peabody Museum referred to above being selected as the type. Two of the paratypes are in the collection of the Boston Society of Natural History, two in the collection of the American Entomological Society at Philadelphia, and the fifth is in the collection of the Conn. Agricultural Experiment Station at New Haven, Conn.

"Male.—The male differs from the female as follows:—greater part of lateral face of pronotum straw-color; an approximately right-angled band on the mesoepisternum, posterior mesal half of pectus, and basal half of venter entirely, straw-color; intermediate coxæ black only at base above, the posterior coxæ except inside and inner longitudinal half beneath, and the apical two-thirds of the posterior tibiæ black (continued to base above).

"Length.—Female 11-13 mm.; male 11 mm.

"The male is here for the first time described, and is the only one that I have seen. It belongs in the collection of the Boston Society of Natural History.

"This subspecies approaches *fisheri* Rohwer from Maryland, and may prove to be the same."

Type locality: Farmington, Connecticut. Westville, New Haven, 17 June, 1905 (W. E. B.).

(For key to other species of *Tenthredo*, see page 83).

ICHNEUMONOIDEA.

VIPIONIDÆ.

Habrobraconidea Viereck.

Related to *Habrobracon* (Ashmead) Johnson, from which it may be known by the antennæ being practically as long as the body and filiform, by the second abscissa of the cubitus being distinctly shorter than the first abscissa of the radius, by the presence of a median longitudinal embossed area on the second and third dorsal abdominal segments, and by the *Atanycolus*-like habitus.

***H. bicoloripes** Viereck.

Female: Length 3.5-5 mm.; black and shining; first joint of flagel a little longer than the second, superior and posterior orbits, the latter above, more or less brownish; mesosternum brownish; wings infuscated, second abscissa of radius as long as, or a little shorter than, the first transverse cubitus, and a little longer than the second transverse cubitus; hind coxæ, trochanters and femora reddish; propodeum with a median longitudinal embossed area on the second dorsal abdominal segment extending a little beyond the middle, apex of second dorsal segment subemarginate, the false suture between the second and third segments crenulate; abdomen reddish throughout and mostly polished, the second dorsal segment with a faint carina on the middle of each side; hypopygium sharply pointed and surpassing the pygidium; exserted portion of ovipositor nearly as long as the body.

The sculpture of the second dorsal abdominal segment is subject to variation, and the basal embossed area on the third dorsal segment may be poorly developed or virtually wanting.

Type locality: Rainbow. Reared from shoots of *Pinus rigida* infested by *Pissodes strobi,* June 25, 1910 (S. N. Spring).

BRACONIDÆ.

Bucculatriplex Viereck.

Related to *Heterogamus* Wesmael, from which it differs especially in the *Polystenidea*-like abdomen, there being four abdominal segments visible dorsally; in the second segment being nearly twice as long as the first and distinctly longer than the following segments combined; in the trapezoidal second submarginal cell; in the simple propodeum with a petiolarea and a median longitudinal carina from the latter to the base; and in the faintly impressed sternauli.

Heterogamus does not occur in Connecticut. In the table of Connecticut genera of Sigalphidæ this genus agrees best with the description of *Aleiodes,* from which it differs radically in the abdomen as described above.

*__B. secundus__ Viereck (new species).

Female: length 1.75 mm.; blackish brown; face including clypeus, mouth parts, malar space and lower part of cheeks, scape, pedicel, legs, and first, second and third ventral abdominal segments mostly stramineous, the legs paler than the face, mandibles with dark tips, scape and pedicel above and rest of antennæ throughout, mostly blackish brown; wings almost colorless with a yellowish cast, the veins and stigma very pale stramineous; tarsal joints especially apically, onychii and claws throughout with a blackish brown tinge, the onychii and claws darkest; abdomen tessellately sculptured.

Type locality: Baltic, 8 September, 1910.

B. sp.

Bred from cage containing birch leaves infested with *latrix canadensisella* Chambers. Emerged 16 March, 1911 W.). This may prove to be the female of *Bucculatriplex latricis* (Ashmead), a species reared from a *Bucculatrix* June 10, 1886, at Washington, D. C.

CAPITONIIDÆ.

Capitonius Brullé.

This is the only genus of this family found in the States.

C. saperdæ Ashmead. *Promachus. Cenocœlius.*

The original description, under *Promachus*, is only a mention in Proceedings U. S. National Museum, Vol. ii, page 1888; but the type is still in the U. S. National Museum. keys to the species of *Capitonius* see Canadian Entomologist, xlvi, page 316, by S. A. Rohwer.

The characters which separate *saperdæ* from the other are as follows:

" Abdomen rufous; head and thorax black; first tergite or less striate, and with an embossed area, defined by strong rinæ which extend beyond the middle of the tergite; strongly foveolate."

C. saperdæ is a parasite of *Saperda candida* in elm.

Wallingford, 22 June, 1912 (D. J. Caffrey); Hamden, June, 1911 (W. E. B.).

ICHNEUMONIDÆ.

Anomalon Panzer.

Nototrachys Marshall.

Agrees with *Erigorgus* as described in this Bulletin except the clypeus which has its anterior edge rounded.

A. sp.

Hamden, 28 May, 1911 (B. H. W.).

***Scambus (Iseropus) viduiformis** Viereck.

Male: length 7-8.5 mm.; this may prove to be the male of *Pimpla vidua* Walsh, the female of which alone is known. tennæ yellow to brownish beneath, blackish above, propode punctate, its angles tipped with yellow; no reddish spot above the mid coxæ and trochanters which are almost entirely yellowish, mid tibiae without a trace of an annulus, hind legs with the coxæ and femora reddish throughout and their trochanters yellow, hind tibiae with the apical third blackish. Second to sixth dorsal abdominal segments, inclusive, sometimes with a subapical, transverse, medially more or less interrupted stripe.

Type locality: New Haven, April 20, 1910 (A. B. C.). Reared from spider egg-sacs on nursery stock imported from Europe. Type: Cat. No. 15035, U. S. N. M.

(For key to other species of this genus, see page 318.)

Xylophruridea Viereck.

Related to *Cryptus* Fabricius.

Mandibles not gibbose at base, notauli indicated only anteriorly, propodeal spiracles round. The sternauli in this genus are very poorly defined, so that this might be taken to be a relative of *Xylonomus* Gravenhorst, were it not for the traces of sternauli.

X. luctuosus (Provancher). *X. agrili* Viereck. *Mesochorus luctuosus* Provancher. *Echthrus luctuosus* (Provancher).

Female and male: length, 8 mm.; flagel, 20-25 jointed, antennæ usually with a whitish annulus; body including most appendages black or blackish; wings mostly almost colorless, tinged with brown, with a brownish substigmal band and brownish tips, veins brownish and blackish, stigma blackish; basal transverse carina present, other carinæ virtually wanting, the median longitudinal carinæ somewhat represented between the basal transverse carina and base of propodeum, making an ill circumscribed basal area; exserted portion of ovipositor hardly half as long as the abdomen.

Reared from *Agrilus vittaticollis* in West Virginia, by F. E. Brooks. Reared from galls of *Agrilus champlaini* on *Ostrya virginica,* collected at Lyme, 11 April, 1912, by H. B. Kirk.

CYNIPOIDEA.

CYNIPIDÆ.

Cynips cristata Stebbins. Oak tufted gall.

Insect Galls of Springfield, Mass., and vicinity, Bulletin 2, Springfield Museum of Natural History, page 24.

"A polythalamous gall on the upper side of the leaf, usually on a vein. About 1 mm. in diameter. Covered with a dense mass of silky hairs about 0.5 mm. long. Red when young, soon becoming brown. On scarlet oak, *Quercus coccinea*, and scrub oak, *Q. nana*."

Evidently the insect is unknown. The galls have been reported from Connecticut by Dr. George Dimmock.

(For other species of *Cynips* see pages 403 and 404.)

Amphibolips cooki Gillette.

Described in the 27th Report on the Agriculture of Michigan, 1888, page 475, reprinted in Psyche, Vol. v, page 220, 1889. Beutenmüller redescribed this species in Bulletin of the American Museum of Natural History, Vol. xxvi, page 58, 1909, and reports it as occurring in Connecticut. His description follows: —

"Female. Head black, face rugoso-aciculate, the furrows spreading out like a fan from either side of the clypeus; vertex and sides coarsely rugose. Antennæ 13-jointed. Thorax black and rather closely aciculated. Parapsidal grooves indistinct, and scarcely traceable. Anterior parallel lines very indistinct. Pleuræ finely and obliquely aciculated. Scutellum coarsely rugose, with the foveæ large, deep and shining. Abdomen dark reddish brown to almost black, smooth and shining, and exceedingly minutely punctate. Legs dark reddish brown, pubescent; coxæ blackish. Wings slightly dusky, hyaline, with a large dark brown patch at the base of the radial cell. Length 5.50 mm.

"Gall. Issuing from a bud on the terminal twigs of red oak (*Quercus rubra*) in September and October. Almost globular and usually with a small nipple at the apex. Green and succulent and spotted with red when fresh, and with the outer shell moderately thick. Internally with a central larval cell held in position by radiating fibres. When old the gall becomes brown and shriveled in appearance. Diameter about 16 to 18 mm."

Amphibolips tinctoriæ Ashmead.

Described in Proceedings U. S. National Museum, Vol. xix, page 125, 1896; redescribed and reported from Connecticut by Beutenmüller in Bulletin of the American Museum of Natural History, Vol. xxvi, page 59, 1909, as follows: —

"Female. Head black, rugose. Antennæ 13-jointed, dark brown. Thorax striate-rugose more or less distinctly striated;

the striæ are sometimes oblique and irregular. Parapsidal grooves obliterated, or only slightly indicated anteriorly. Scutellum coarsely rugose with the foveæ large, deep and separated by a carina. Pleuræ rugose, usually pubescent and sometimes with a raised polished area. Abdomen black, dark brown beneath, and margins of second and following segments brown. Legs reddish yellow. Wings hyaline, veins distinct, dark brown, first cross-vein angulated and enclosed in a brown patch. Areolet large. Length 4.6 to 5 mm.

"Gall. Issuing from a bud on quercitron or yellow oak (*Quercus velutina*) and red oak (*Quercus rubra*) in autumn. Almond-shaped, acuminate, at tip, compressed with the opposite sides keeled. Green or red when fresh and brown when old. Rather thick-shelled and smooth. Internally it is hollow with a central larval cell held in position by radiating fibres. Length 12 to 20 mm."

(For other species of *Amphibolips* see pages 404-408.)

Andricus (Callirhytis) fructicola Ashmead.

Originally described in Proceedings U. S. National Museum, Vol. xix, page 131, 1896, as follows: —

"Gall. This gall consists simply of the white kernel or larval cell embedded in the interior or meaty portion of the acorn, or when on the outside near its base, generally hidden by the cup.

"Two or three acorns in Dr. Riley's collection, affected by this species, when cut open, revealed more than a dozen larval cells, closely pressing upon one another, and filling the whole interior of the acorn.

"Gall-fly. Female. Length 3 to 3.6 mm. Brownish red, the eyes and middle and posterior tibiæ dark brown.

"Antennæ 13-jointed, filiform, the scape clavate, as long as the third joint, the fourth joint one-third shorter than the third. Head and thorax closely, minutely rugosely punctate, subpubescent; the parapsidal grooves distinct, entire; anteriorly are two short grooves reaching to near the middle of the mesonotum, and the groove on the shoulders is long. Foveæ of scutellum large, separated only by a carina. Mesopleura punctate, slightly aciculated posteriorly. Abdomen longer than the head and thorax together, gradually rounded off posteriorly, and [as seen] from below a little obliquely rounded, the second segment occupying two-thirds of its whole length, the sutures running obliquely forward to the venter, ventral valve hidden, the sheaths of ovipositor short but slightly projecting. Wings hyaline, veins pale brown, the cubitus and radius very slender, pale, the vein at base of marginal cell arcuate, the areolet wanting."

Recorded from Connecticut by W. Beutenmüller.

A. glandulus Beutenmüller.

The original description was published in Bulletin of the Brooklyn Entomological Society, Vol. viii, page 103, 1913, and Connecticut is included in the area of distribution of this insect. The original description is reproduced here: —

" Female. Form robust. Uniform light cinnamon-brown. Legs somewhat paler with the middle and hind femora dark brown. Head finely granulated and subtriangular in shape. Antennæ 14-jointed, stout, and almost uniform in width, 1st joint long, 2nd small, 3rd long, 4th, 5th and 6th shorter than the 3rd and subequal. The following joints small and almost equal in size. Thorax robust, about as long as broad, finely and evenly granulated. Parapsidal grooves well defined, punctate, inwardly curved anteriorly, thence parallel nearly to the scutellum where they curve outwardly and converge, though fairly well apart. Anterior parallel grooves fine and extending a little beyond the middle of the thorax where they are slightly divergent. Lateral grooves short. Collar rugose. Pleuræ minutely aciculated. Scutellum more granulated than the thorax with a broad prominent transverse shining groove or channel at the base. Abdomen well rounded dorsally, the large second segment smooth, the following segments microscopically punctate. At the base of the second segment are a few minute whitish hairs. Sheath of ovipositor black, stout and extending upward but not beyond the anal segment. Wings pale, hyaline, cross and basal veins heavy, yellowish brown and very slightly clouded with the same color, outer veins faint; radial area broad and open at the costal margin; second cross-vein bluntly angulate or rounded outwardly; areolet very small; cubitus fine and not extending to the cross-vein. Length 2.50 to 3.25 mm.

" Gall. In the cups of acorns of swamp white oak (*Quercus platanoides*), burr oak (*Q. macrocarpa*), dwarf chestnut oak (*Q. prinoides*), chestnut oak (*Q. prinus*), and probably other trees belonging to the white oak group. Monothalamous. The gall is formed in a cavity, causing more or less bulging and swelling of the acorn cup. It is an elongate body averaging when well developed 5 mm. long and not quite half as wide. The sides are sometimes parallel, but more often slightly bulging or sometimes longitudinally ribbed or smooth; whitish green, yellowish, often with a roseate tinge. The base is truncate and covered with a whitish down. The crown is flattened or slightly concave with a small central conical nipple. The mouth of the cavity in the acorn cup is either strongly fimbriated or simple, according to the nature of the cup scales, and thus either concealing the gall or exposing a large part of it. The larva lies in a cell near the top of the gall. Sometimes the galls deform the acorns."

(For other species of *Andricus* see pages 409-434.)

Rhodites globuloides Beutenmüller.

Originally described in Bulletin of the American Museum of Natural History, Vol. xxiii, page 638, as follows: —

"Female. Head black, finely and evenly punctate, with microscopic hairs. Antennæ black, first and second joints rufous, third joint piceous. Thorax evenly rugose, subopaque. Anterior lines wanting. Median groove from the scutellum scarcely visible. Parapsidal grooves very obsolete, slightly evident posteriorly. Pleuræ rugose, subopaque, somewhat shining beneath the wings. Scutellum very rugose, black. Abdomen and legs rufous. Wings subhyaline, yellowish; radial cell heavily clouded with brown on the veins with the disc hyaline, the brown shade extends beyond the veins. Length 3 mm.

"Gall. Polythalamous. Smooth, rounded or oblong, arising at each end abruptly from the branch. Green and fleshy when fresh; and brown, soft and corky when dry. Measures from about 10 to about 22 mm. in width and 35 mm. in length."

Beutenmüller records this species from Connecticut.

Mystic, 3, 12, 14 March, 1915 (I. W. Davis).

R. gracilis Ashmead.

Described in Proceedings U. S. National Museum, Vol. xix, page 135, 1896; reprinted by Beutenmüller in Bulletin of the American Museum of Natural History, Vol. xxiii, page 645, 1907, and habitat is given as unknown. The original description is as follows: —

"Gall. An irregular, inflated, rounded gall, with the top broadened and somewhat flattened, the edges surrounded with short, blunt tubercles, which are probably the apices of elevated ribs.

"Gall-fly. Male and female. Length, 2.2 to 3 mm. In the male the two basal antennal joints and legs are red; in the female the whole abdomen is red; rest of the insect black. Head finely, closely punctate, the vertex almost smooth, thorax, scutellum, and pleura rugose, parapsidal grooves distinct posteriorly, somewhat obliterated by the sculpture anteriorly, the middle lobe with a central longitudinal depression. Antennæ 14-jointed, the third joint very long, more than twice as long as the fourth. Wings hyaline, veins brown, the areolet large, cubital cell almost closed; in the female the basal vein of the closed radial cell and the radius are surrounded with a dusky cloud, which is wanting in the male."

Galls on rose, probably *Rosa carolina,* answering this description, were received from Sharon, 27 August, 1915, where they were collected by Mrs. Harriet K. Taylor.

(For other species of *Rhodites* see pages 440-442.)

CHALCIDOIDEA.

MISCOGASTERIDÆ.

This family is not included in the key to families, but is related to the Perilampidæ and Eurytomidæ, from which it differs in the pronotum being conical, or conically produced anteriorly, or very short, transverse-linear and very much narrowed medially, rarely as wide as the mesonotum, rarely transverse-quadrate; furthermore, in this family the mesepisternum is triangular, not large. The fore femora are never much swollen, and the hind femora are also normal or only slightly swollen; the marginal vein in the hind wings usually long; the costal cell not reaching to the hooklets or spinulæ and most frequently narrow; radius well developed. This family is superficially like the Pteromalidæ, from which it differs especially in its two-spurred hind tibiæ.

Megorismus Walker.

Clypeus not transverse, antennæ 12-13 jointed; pronotum not distinctly separated from the mesonotum, notauli complete, delicately impressed posteriorly, mesonotal lobes flat or at most subconvex, marginal vein always shorter than the subcostal vein, scutel with a more or less distinct cross-furrow before the apex, the lateral margins convergent toward base; propodeum normal, not produced at apex, long, rugose, with a median carina and complete lateral folds; abdomen distinctly petiolate, second segment often large but not especially lengthened, ovipositor not exserted.

M. fletcheri Crawford.

Female: length 1.5-1.75 mm.; brcnzy green; head with sparse setigerous punctures, reticulated except for the face in front of the ocelli which is smooth and polished, antennæ black, scape metallic; thorax with sparse setigerous punctures like the head, and reticulated except posterior margin of pronotum, scapulæ laterally and scutel back of the transverse furrow, which parts are smooth; wings yellowish, veins stramineous; coxæ metallic, rest of legs testaceous; propodeum with a smooth space on each side near the base; petiole longitudinally rugose, rest of abdomen smooth.

Male: length 1.5 mm.; essentially as in the female except for the flagel which is light brownish.

Parasitic on *Nectarophora pisi* in Canada, and bred from *Aphis sorbi* in Connecticut.

New Haven, 10 July, 1909 (A. I. Bourne).

PTEROMALIDÆ.

Pteromalus Swederus.

Subgenus **Eupteromalus** Kurdjumov.

Related to *Dibrachys* Foerster, from which it can be distinguished by the propodeum being produced into a distinct globose neck. Eyes not hairy; antennæ inserted near the middle of the face, front not impressed, pedicel longer than the first joint of the funicle.

Pteromalus (Eupteromalus) nidulans (Foerster) Thomson.
Pteromalus egregius Howard and Fiske.

Female: length 2.2 mm.; greenish with cupreous reflections, scape, pedicel and legs except coxæ stramineous with brownish stains, rest of antennæ brown; head and thorax finely reticulated; propodeum reticulated like the thorax, with a longitudinal carina between its base and its neck; abdomen greenish, polished, with cupreous reflections.

Male: length 1.2 mm.; greenish without cupreous stains, legs except coxæ yellowish, otherwise nearly as in the female.

Parasitic on the brown tail moth (*Euproctis chrysorrhœa*), and introduced from the Old World into Massachusetts. Recovered from winter nests taken at Hartford in 1913 and 1915.

(For other species of *Pteromalus* see pages 471-478.)

APHELINIDÆ.

Prospaltella Ashmead.

Prospalta Howard (preoccupied).

Related to *Coccophagus* Westwood, from which it differs in the marginal vein being much shorter than the submarginal vein.

(For a characterization of this genus, see Insect Life, Vol. vii, page 6, and for key to other species see Annals of the Entomological Society of America, Vol. i, page 281.)

P. perniciosi Tower.

An important parasite of the San Jose scale (*Aspidiotus perniciosus*). The original description of this species may be found in Annals of the Entomological Society of America, Vol. vi, page 125, and is as follows: —

"Female: length, 0.61 mm.; expanse, 1.73 mm.; greatest width of fore wing, 0.25 mm. General color of living specimens black with the mesoscutellum showing as a prominent light dot. In xylol-balsam mounts the head and central portions of the thorax are light brown. Head: vertex yellowish brown; occiput dark; ocelli dark; eyes black and hairy, the hairs about as long as the diameter of a facet. Antenna: brownish yellow; bulb twice as long as wide, cylindrical and nearly hyaline; scape nearly five times as long as wide, nearly hyaline at each end, more or less cylindrical to spindle-shaped; pedicle slightly longer than wide, narrow at its base, widest well toward its tip, its inner side much farther from the axis of the antenna than its outer side; first funicle segment connected with pedicle by a narrow somewhat elongate stalk, which is quite hyaline; this segment a trifle more than half the length of the next and irregular in outline; second and third segments of the funicle nearly equal in size and nearly cylindrical; segments of the club more closely articulated to each other than to the funicle or than are the segments of the funicle to each other; club slightly longer than funicle; first two segments about equal in length, their greatest diameter being at their outer ends; terminal segment elongate, triangular in outline, and longer than either of the other segments, bluntly pointed at tip; all segments of antenna bearing scattered hairs.

"Thorax: pronotum dark; mesoscutum brownish yellow, darker near the anterior edge, mesoscutar parapsida [scapulæ] same color or lighter than mesoscutum with a darker spot well forward toward the base of the fore wing; scapula [axillæ] dark; mesoscutellum noticeably paler than mesoscutum. Behind the mesoscutellum are two narrow transverse plates dark toward their lateral margins and light near the middle, the posterior plate with a spiracle near each lateral margin. Marginal and submarginal veins of fore wing nearly equal in length; end of stigmal vein obscurely pointed, not reaching wing margin, its upper side slightly emarginated, its anal margin broadly rounded; a broad dusky band crosses the fore wing below the marginal vein; hind wing lanceolate; legs pale yellow except the coxæ, femora, and basal halves of tibiæ, these being dark, the coxa being the darkest portion of each leg, those of the hind legs being the darkest; fore legs as a whole the lightest and the hind legs the darkest; trochanters nearly hyaline.

"Abdomen: short, broad, nearly quadrangular in outline; quite dark with faint transverse lighter bands and a yellowish brown area near the genitalia: with spines directed backward evident on the sides (above and below also?).

"Male: length, 0.56 mm.; expanse, 1.54 mm.; greatest width of fore wings, 0.26 mm. Living and mounted specimens appear the same as females, except that they are smaller, and the mesoscutellum is not as light in color. The antenna differs in that the first funicle segment is as long as the second, and its diameter at its distal end is greater than the diameter of either of the other two funicle segments. Its base is rounded and stalked, and it does not give the effect of a bead as does the corresponding segment in the female antenna. The articulation between the second and third segments of the club is not as evident as between the first and second segments, while in the female both articulations are very clear and well defined. The thorax as a whole is darker than that of the female, the only light portions being the mesoscutellum and the portion of the mesoscutar parapsida [scapulæ] nearest it. The hind margin of the stigmal vein is more angular than in the female. The faintly cloudy band below the marginal vein is hardly distinguishable. The abdomen is short, much narrower than the thorax, truncate, dark, and not showing lighter bands, but lighter near the genitalia, which extrude, the tips of these being nearly hyaline."

Stonington, New Haven, October, 1913 (I. W. Davis); Ridgefield, 8 December, 1914 (Q. S. Lowry); Hartford, New Haven, 23 September, 1915 (B. H. W.).

APOIDEA.

ANDRENIDÆ.

Andrena claytoniæ Robertson.

A small to medium-sized species first described by Charles Robertson in Transactions American Entomological Society, Vol. xviii, page 59, as follows:—

"Female: Black; clypeus closely and strongly punctured, often with a median impunctate line, basal process of labrum rather long and narrow, emarginate or notched at tip; thorax rather sparsely punctured with rather fine, shallow punctures, thinly clothed with short, pale fulvous pubescence, enclosure of metathorax rough with strong longitudinal rugæ, with a poorly defined border; wings hyaline, nervures and stigma honey-yellow, tegulæ dull testaceous exteriorly, second submarginal cell receiving the first recurrent nervure near its apex; legs black, inclining to dull ferruginous, the tarsi more or less yellowish, the hind tarsi and sometimes the hind tibiæ yellowish; abdomen finely and rather sparsely punctured, the apical one-third of each segment depressed, segments 2-4 with apical fasciæ of whitish pubescence, interrupted on the second, anal fimbria pale fulvous. Length 8-10 mm.

"Male. Resembles the female; the tarsi, and often the posterior tibiæ, yellowish testaceous. Length 7-8 mm."

This species visits the flowers of pear, plum, strawberry, redbud, shad-bush, *Claytonia virginica, Zizia, aurea, Heracleum lanatum, Antennaria plantaginifolia,* and *Salix cordata.*

New Haven, 25 May, 1903, 9, 22 May, 1905 (B. H. W.), 10 May, 1904 (H. L. V.).

A. krigiana Robertson.

A medium-sized species originally described by Charles Robertson in Canadian Entomologist, Vol. xxxiii, page 229, as follows: —

"Female: Black; mandibles rufous at tips, toothed near the apex; basal process of labrum short, subquadrate, emarginate; clypeus somewhat shining towards apex, where it is rather distinctly punctured, elsewhere opaque and reticulated; face before ocelli longitudinally striate; facial foveæ quite short, not descending below insertion of antennæ, filled with a fine pubescence which appears black; antennæ short, joint 3 as long as the next three together, or nearly so, apical joints dull testaceous beneath; thorax throughout opaque and finely reticulated; enclosure of metathorax poorly defined, but rather strongly rugose; pubescence of head and thorax rather thin and dull fulvous; wings subhyaline, nervures and stigma honey-yellow, second cubital cell about one-third as long as the third, oblique, receiving the first recurrent nervure at, or a little before, or a little beyond, the middle; abdomen shining, rather sparsely and rather evenly punctured, apical margins of segments pale testaceous, hardly subfasciate, fimbria fulvous; scopæ pale, the hairs of hind tibiæ rather strongly plumose. Length 8 mm.

"Male. Resembles the female; the face before ocelli not striate; clypeus with a large trilobed yellow spot. Length 8 mm."

New Haven, 13 June, 1902 (E.J.S.M.).

(See page 709 for key to other species of *Andrena*.)

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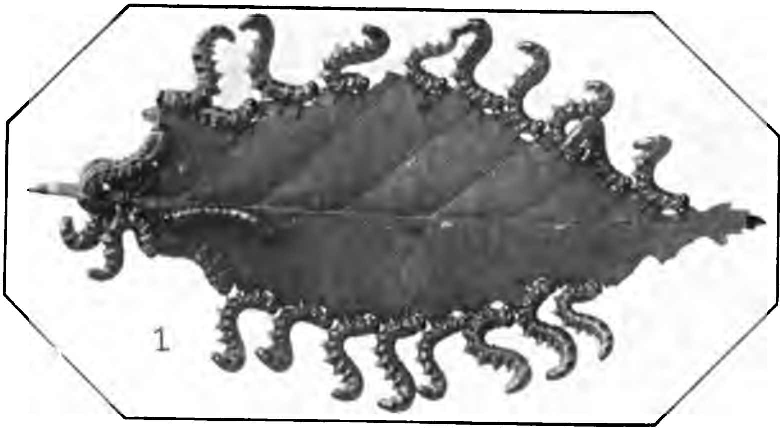
PLATE I.

HYMENOPTEROUS LARVÆ.

1. *Cræsus latitarsus* Nort., on birch.
2. Giant Sawfly, *Cimbex americana* Leach.
3. A Sawfly larva, possibly (*Pteronus*) *Pteronidea ventralis* Say, feeding on willow.
4. *Tomostethus* (*Monophadnus*) *bardus* Say, on ash.
5. Peach Sawfly, *Pamphilius persicus* MacG.

All natural size.

Plate I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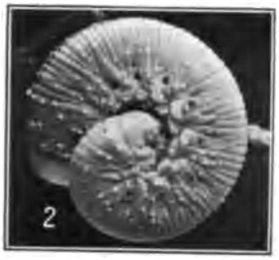
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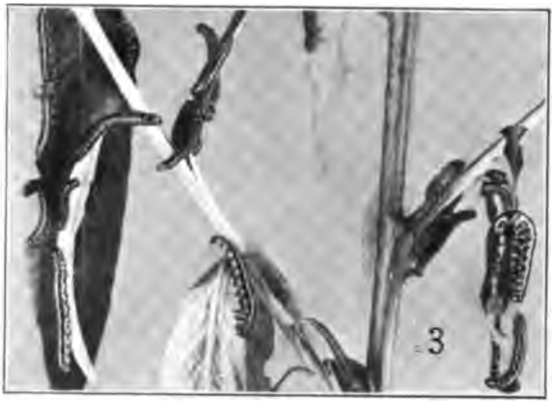
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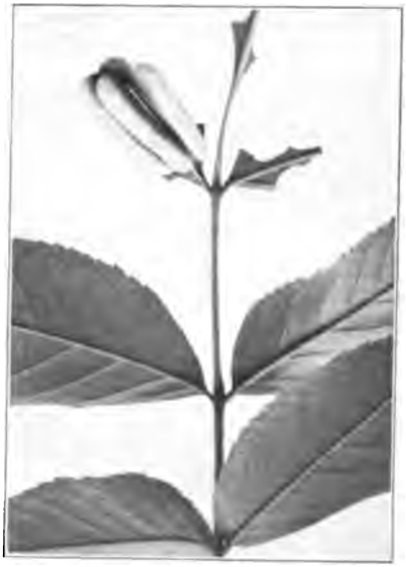
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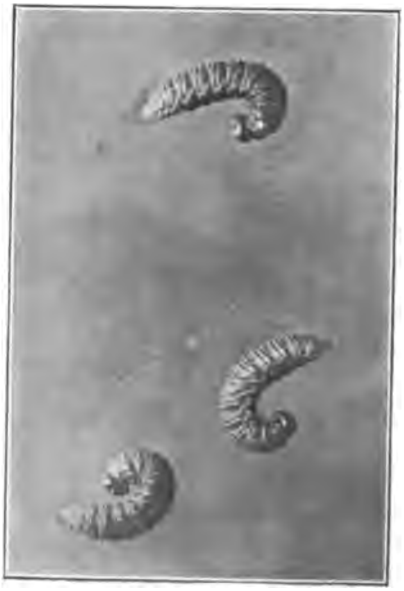
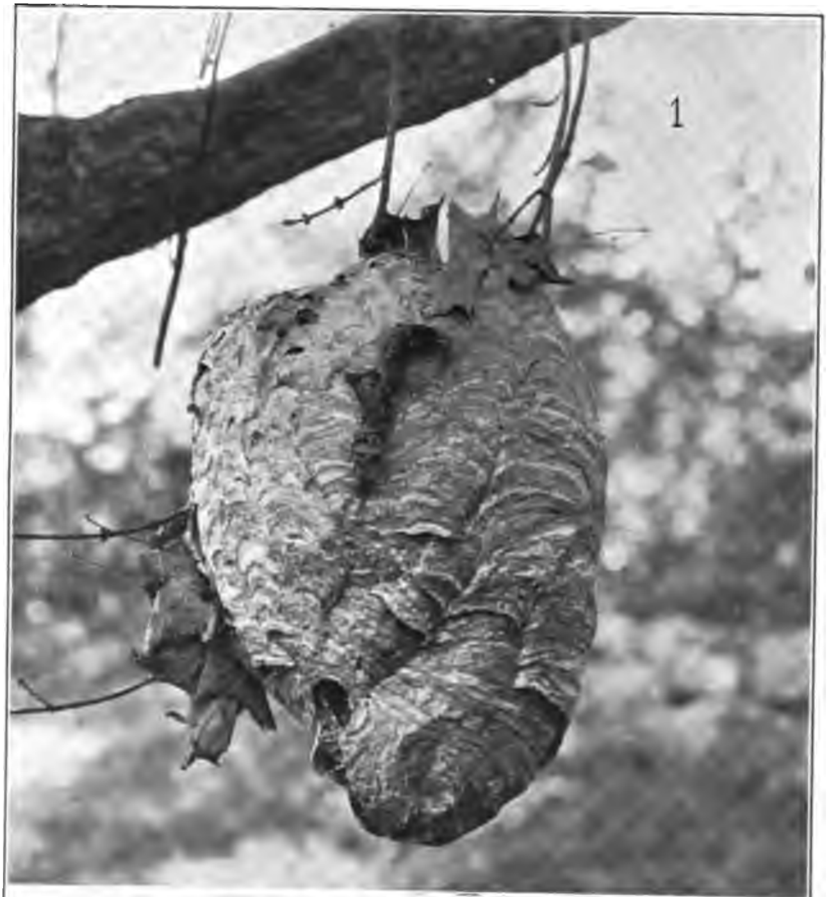


PLATE II.

1 Nest of White-faced Hornet, (*Vespa*) *Vespula maculata* Linn. Much reduced.

2. Nest of Common Wasp, *Polistes pallipes* LePel. Natural size.

Plate II



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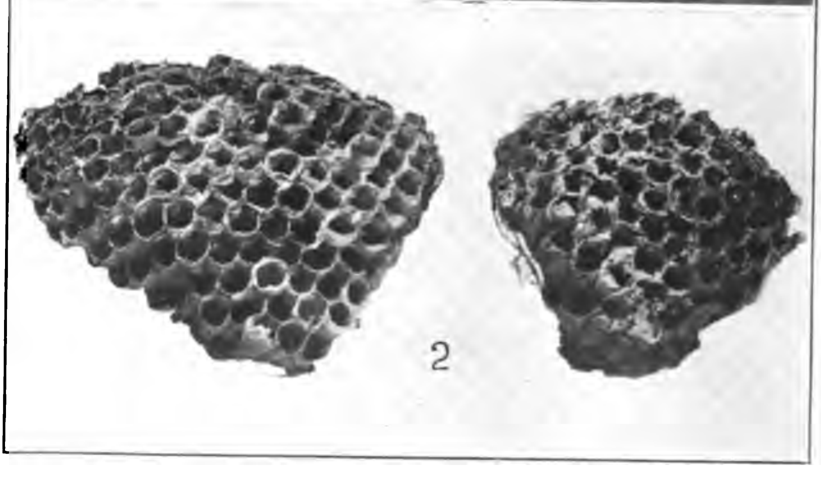

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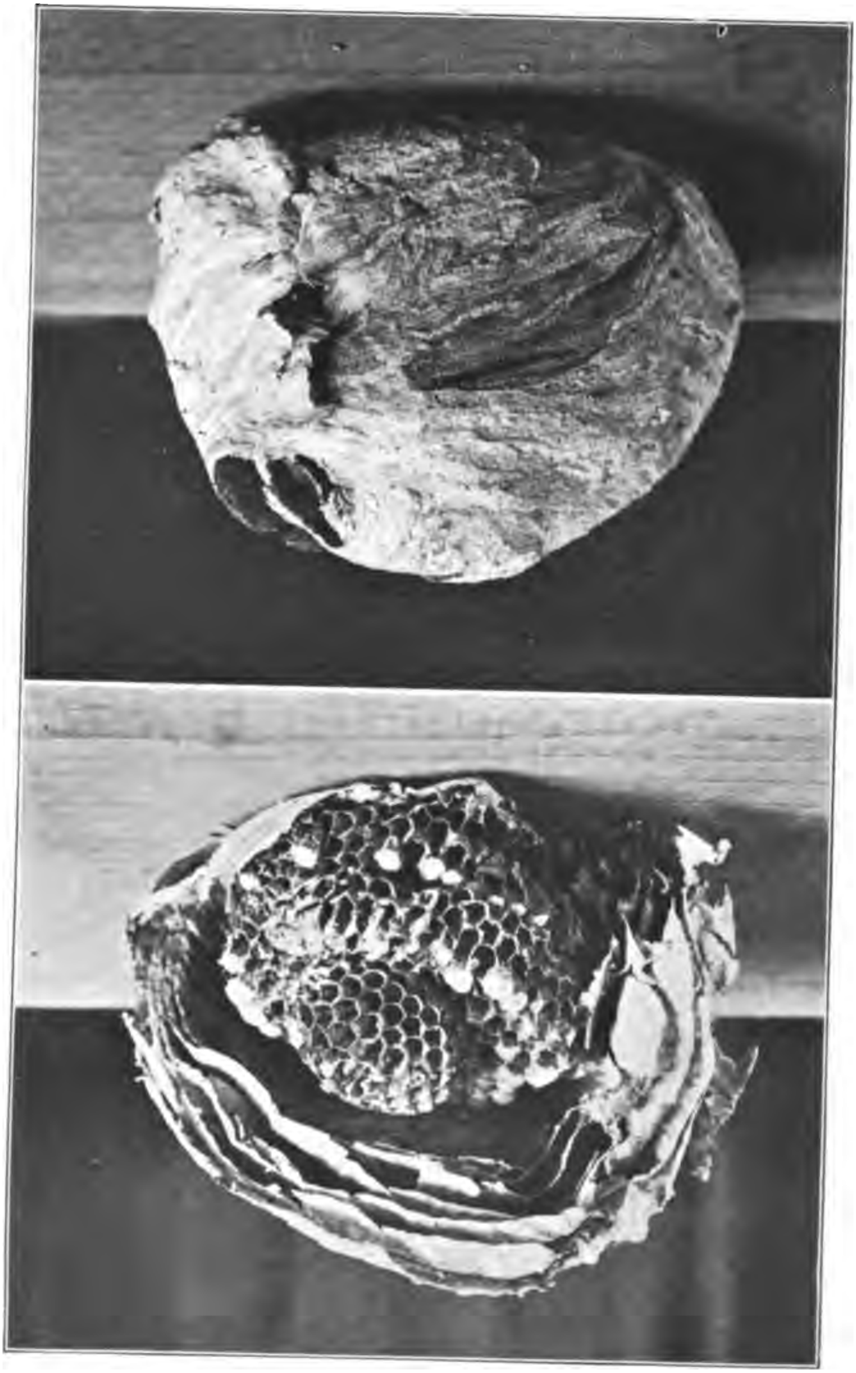
Plate III



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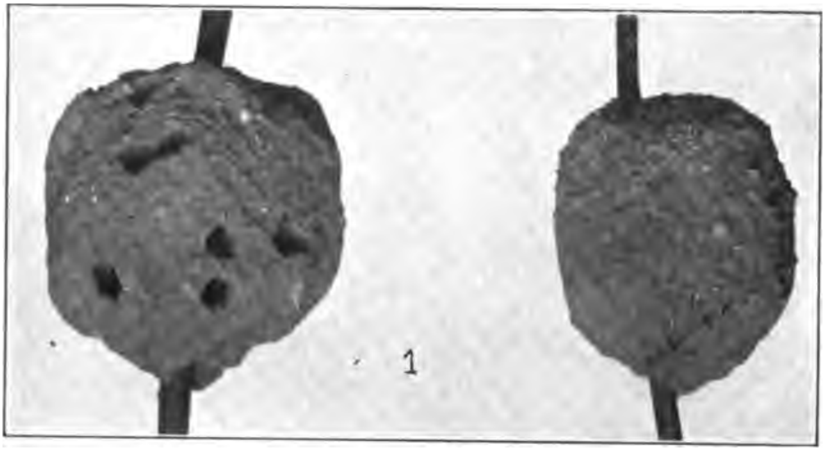

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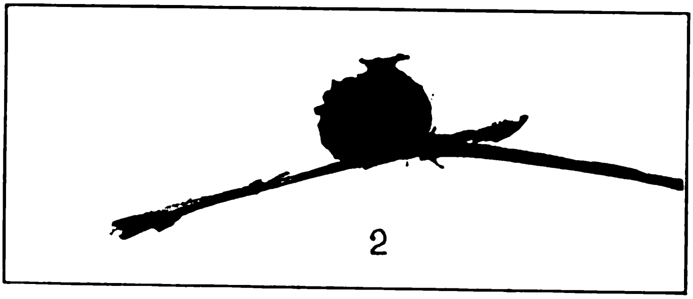

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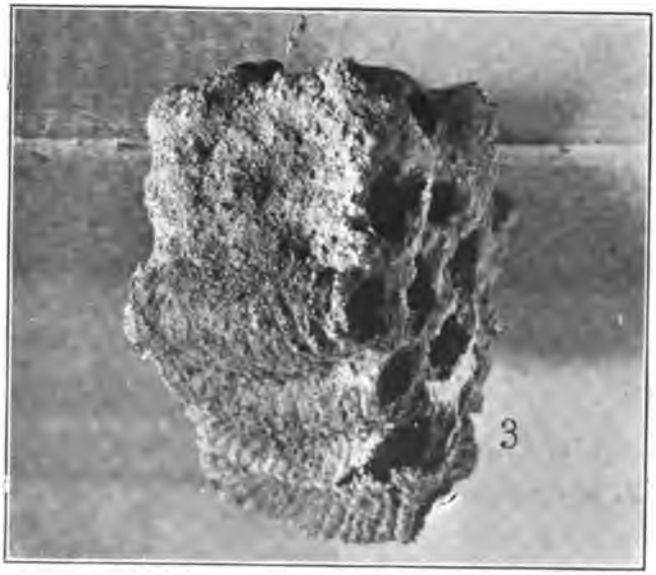

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PLATE V.

Nest of *Formica exsectoides* Forel, a common Ant.

Plate V

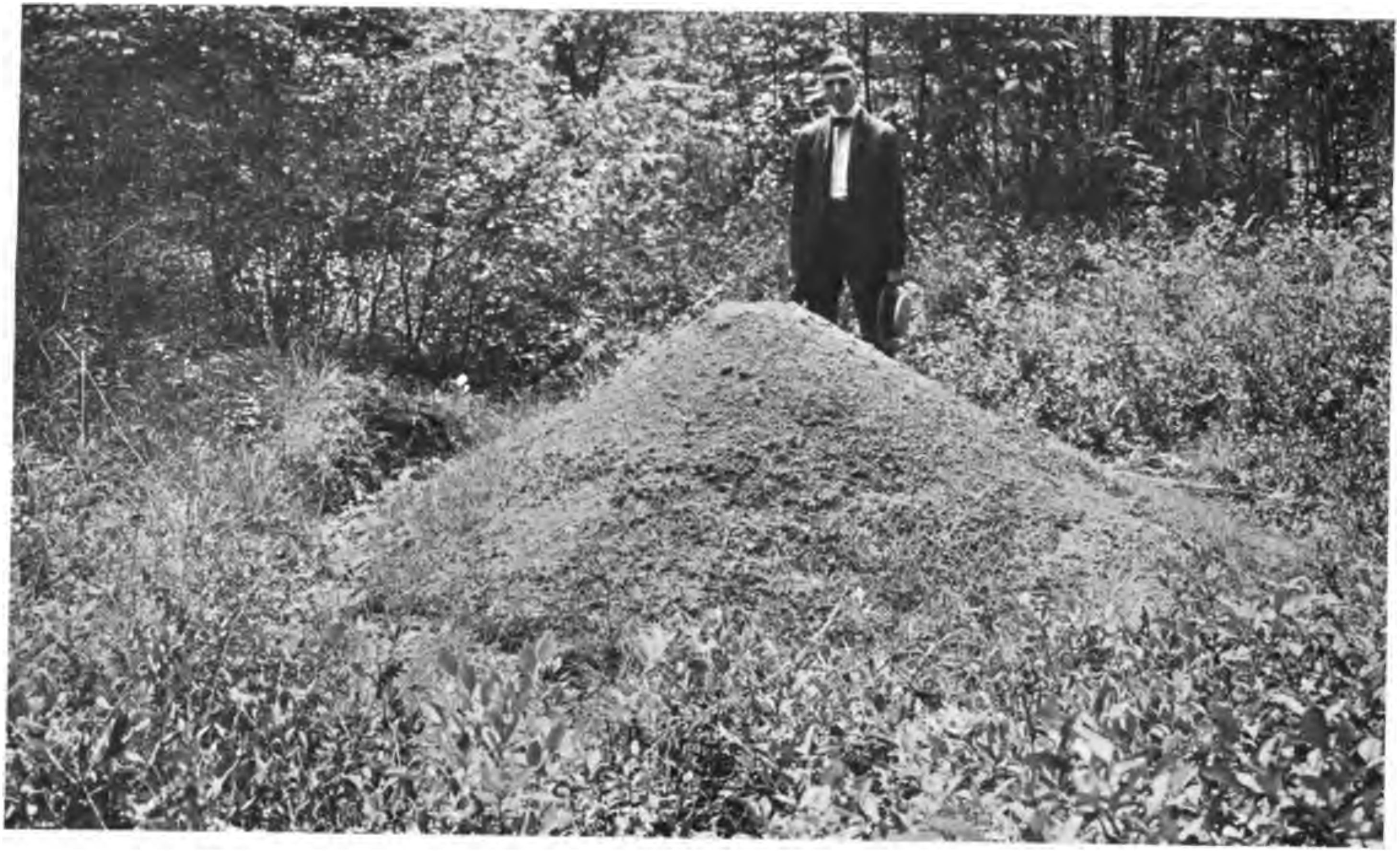

PLATE VI.

GALLS FORMED BY HYMENOPTEROUS INSECTS.

1. Blackberry Seed Gall, *Diastrophus cuscutæformis* O. S.
2. Knot Gall, *Diastrophus nebulosus* O. S.
3. Mealy Rose Gall, *Rhodites ignotus* O. S.
4. Oak Bullet Gall, *Holcaspis globulus* Fitch.
5. Mossy Rose Gall, *Rhodites rosæ* Linn.

All natural size.

Plate VI

1

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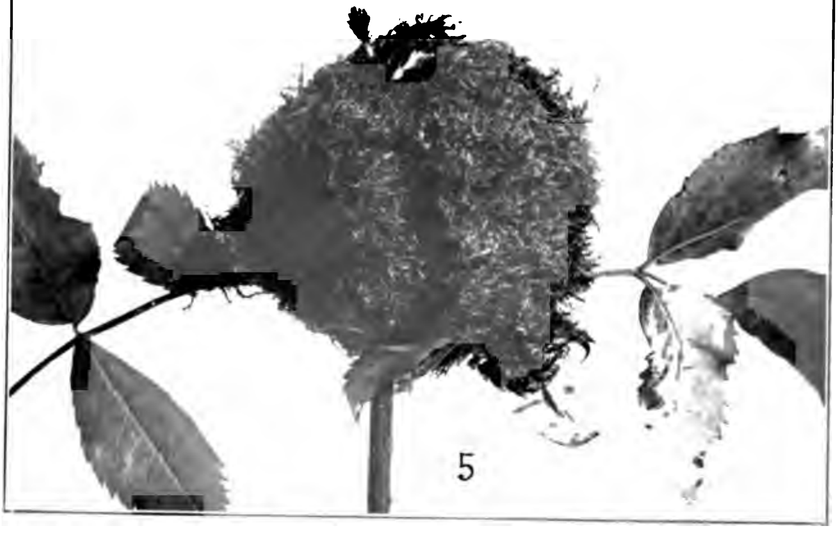
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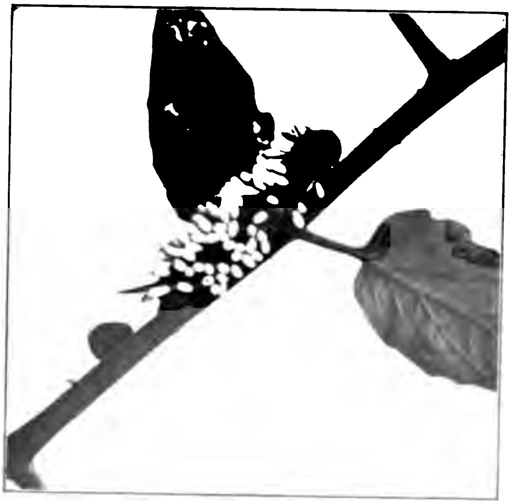
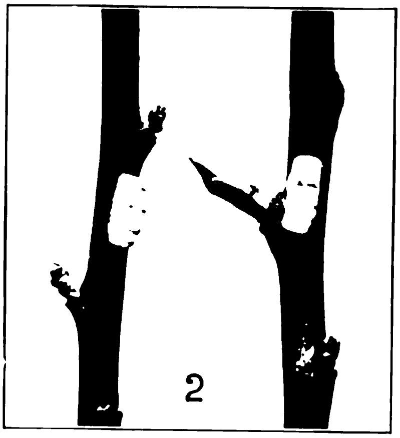
PLATE VII.

1. Cocoons of *Apanteles* (*Protapanteles*) *congregatus* Say on young Tobacco Worm. Natural size.
2. Cocoons of a Microgasterine, the host of *Pezomachus minimus* Walsh, on apple twig. Natural size.
3. Cocoons of a Microgasterine, *Apanteles* (*Protapanteles*) *glomeratus* (Linn), a parasite of the Cabbage Worm. Twice natural size.

Plate VII





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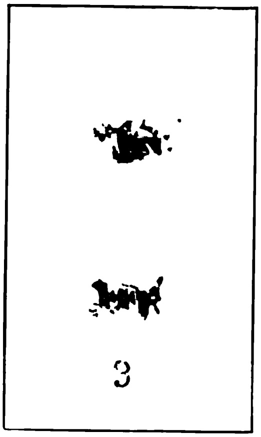

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PLATE VIII.

1. Peach Sawfly, *Pamphilius persicus* MacG.
2. Pigeon Horntail, *Tremex columba* Linn. (female).
3. Pigeon Horntail, *Tremex columba* Linn. (male).
4. *Elis quinquecincta* Fabr.
5. Potter Wasp, *Eumenes fraterna* Say.
6. Giant Sawfly, *Cimbex americana* Leach.
7. *Chlorion* (*Ammobia*) *ichneumoneum* Linn.
8. Common Wasp, *Polistes pallipes* LePel.
9. *Chlorion* (*Ammobia*) *pennsylvanicum* Linn.
10. European Giant Hornet, *Vespa crabro* Linn.
11. *Mutilla ferrugata* Fabr.
12. Large Velvet Ant, *Mutilla occidentalis* Linn.
13. Common Yellow-jacket, (*Vespa*) *Vespula diabolica* Sauss.
14. Mud Wasp, *Chalybion cœruleum* (Linn).
15. Giant Digger Wasp, *Sphecius speciosus* Drury.
16. White-faced Hornet, (*Vespa*) *Vespula maculata* Linn.

All natural size.

Plate VIII

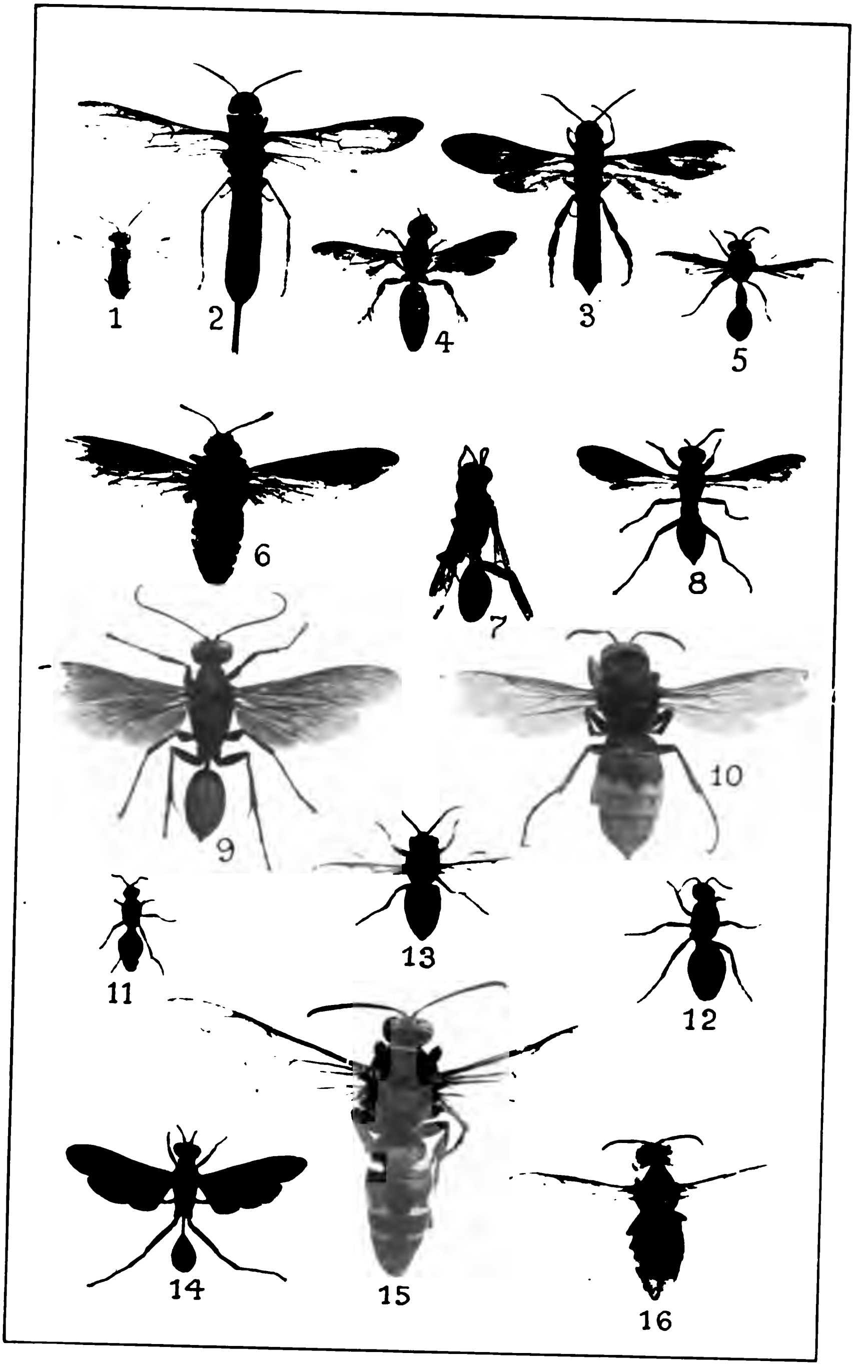


PLATE IX.

1. *Pelecinus polyturator* Drury (female).
2. (*Ichneumon*) *Amblyteles comes* Cresson.
3. *Meniscus superbus* Prov.
4. Lunate Long-sting, (*Thalessa*) *Megarhyssa lunator* (Fabr.) (male).
5. Black Long-sting, (*Thalessa*) *Megarhyssa atrata* (Fabr.) (female).
6. Black Long-sting, (*Thalessa*) *Megarhyssa atrata* (Fabr.) (male).
7. *Ophion* (*Allocamptus*) *macrurus* Linn.
8. *Trogus vulpinus* Gravenhorst.
9. *Paniscus geminatus* Say.
10. (*Pimpla*) *Pimplidea marginata* (Prov.).
11. *Heteropelma flavicorne* Brullé.

All natural size.

Plate IX

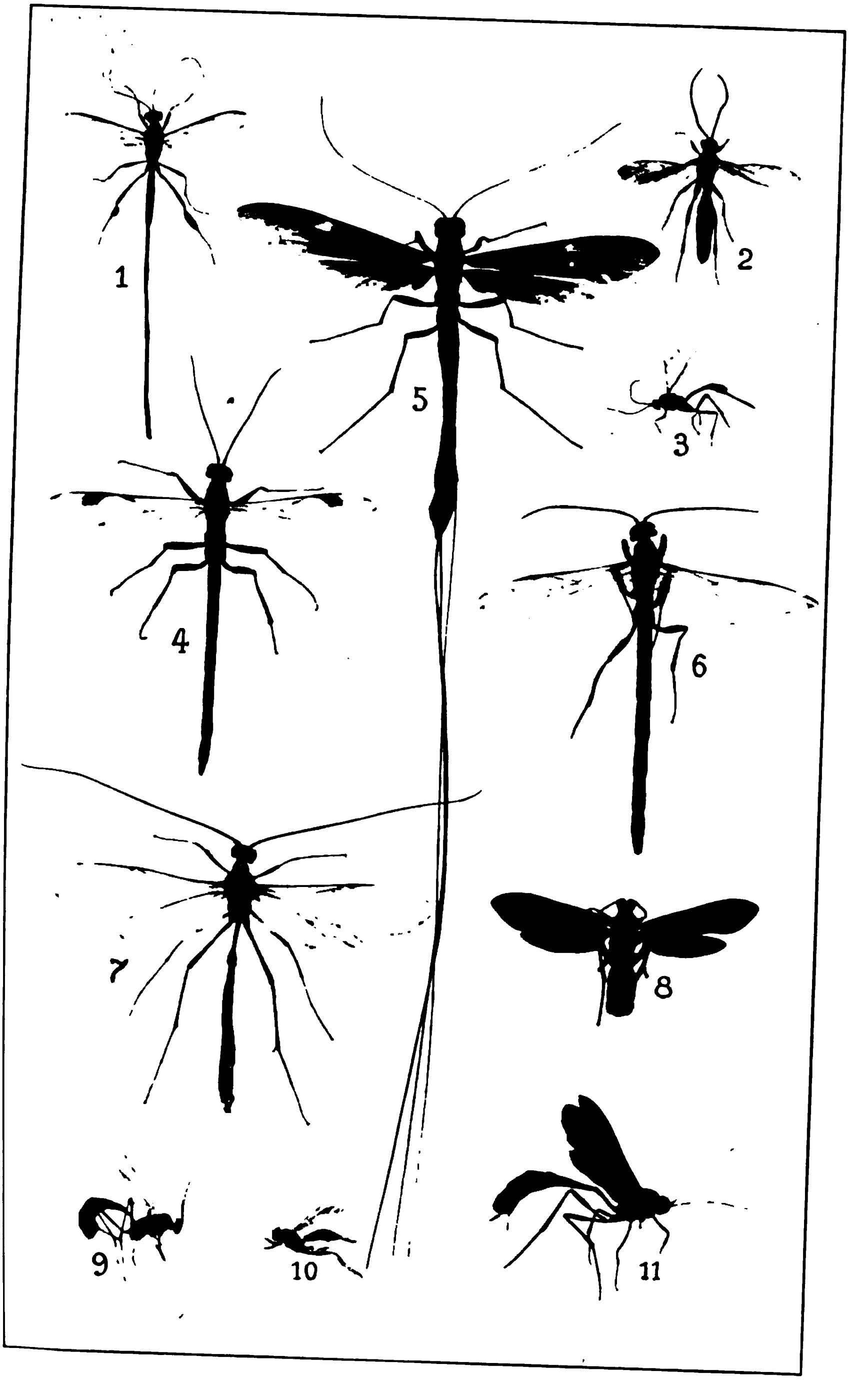


PLATE X.

1. *Megachile (Xanthosarus) latimana* Say.
2. Carpenter Bee, *Xylocopa virginica* Drury.
3. Honey Bee, *Apis mellifera* Linn.
4. *Bembex spinolæ* LePel.
5. Bumblebee, (*Bombus*) *Bremus pennsylvanicus* Degeer (female).
6. *Xenoglossa (Peponapis) pruinosa* Say.
7. *Halictus lerouxi* LePel.
8. Bumblebee, (*Bombus*) *Bremus terricola* Kirby (female).
9. *Halictus (Agapostemon) virescens* Fabr.
10. *Andrena solidaginis* Robt.
11. Bumblebee, (*Bombus*) *Bremus impatiens* Harr. (female).
12. *Andrena vicina* Sm.
13. Carpenter Ant, *Camponotus pennsylvanicus* Degeer (winged form).
14. Carpenter Ant, *Camponotus pennsylvanicus* Degeer (wingless form).
15. *Chrysis (Tetrachrysis) cærulans* Fabr.

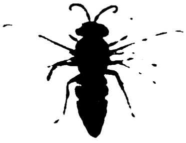
All natural size.

Plate X

1

2

3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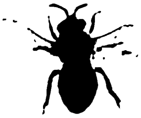
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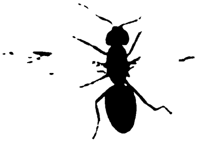
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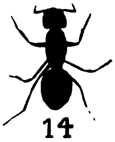
14

15